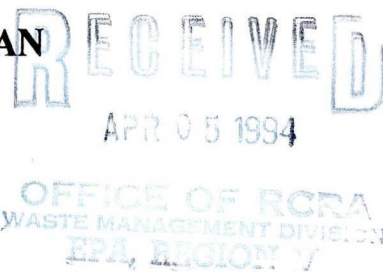




1000780

Quality Assurance Project Plan  
Techalloy RFI  
Revision: 2  
Date: 24 March 1994

**FINAL QUALITY ASSURANCE PROJECT PLAN  
FOR THE  
RCRA FACILITY INVESTIGATION  
TECHALLOY COMPANY, INC.  
UNION, ILLINOIS**



March 1994

Prepared  
and

Approved by:

Carlos J. Serna, P.G., WESTON  
Project Manager

Date:

3/23/94

Approved by:

Robert H. Gilbertsen, P.E.  
Lead Project CMS Investigator

Date:

23 MARCH 94

Approved by:

John W. Thorsen, P.E., WESTON  
Project Director

Date:

28 March 1994

Approved by:

Raymond J. Frederici  
Laboratory Quality Assurance Manager

Date:

Approved by:

Henry Lopes, Techalloy Company, Inc.  
Vice President

Date:

3/28/94

Approved by:

William Buller, U.S. EPA  
RCRA Project Coordinator

Date:

7/19/94

Approved by:

Willie Harris, U.S. EPA  
Regional Quality Assurance Manager

Date:

5/27/94

Approved by:

Charles Elly, U.S. EPA Region V  
Director, Central Regional Laboratory

Date:

Approved by:

Robert C. Brod  
Quality Assurance Manager

Date:

3/23/94

Work Order No. 01989-009-001-0040

**Techalloy**  
**Company, Inc.**

**FILE COPY**

*Conditional Approval*  
*5/27/94*

---

## **RCRA Facility Investigation Final Quality Assurance Project Plan**

**Techalloy Company, Inc.**  
**Union, Illinois**

---

Revision 0 April 1993  
Revision 1 September 1993  
Revision 2 March 1994

**WESTON**  
MANAGERS DESIGNERS/CONSULTANTS

---

**FINAL QUALITY ASSURANCE PROJECT PLAN  
FOR THE  
RCRA FACILITY INVESTIGATION  
TECHALLOY COMPANY, INC.  
UNION, ILLINOIS**

Prepared for  
**TECHALLOY COMPANY, INC.**  
Union, Illinois

Prepared by  
**ROY F. WESTON, INC.**  
Three Hawthorn Parkway  
Vernon Hills, Illinois 60061

March 1994

Work Order No. 01989-009-001-0040



Roy F. Weston, Inc.  
Suite 400  
3 Hawthorn Parkway  
Vernon Hills, Illinois 60061-1450  
708-918-4000 • Fax 708-918-4055

31 May 1994

RECEIVED

MAY 20 1994

OFFICE OF RCRA  
WASTE MANAGEMENT DIVISION  
EPA, REGION V

Mr. William Buller  
Project Manager, HRE-8J  
U.S. Environmental Protection Agency  
77 West Jackson Boulevard  
Chicago, IL 60604-3590

Re: Quality Assurance Project Plan  
RCRA Facility Investigation  
Technology Company, Inc.  
ILD 005 178 975

D.2.1

Dear Mr. Buller:

The purpose of this letter is to clarify the status of the Quality Assurance Project Plan for the referenced project. As was noted in the letter dated 2 March 1994 from Roy F. Weston, Inc. (WESTON\*), the QAPP was revised for the second time. In that letter, WESTON stated that it was our understanding that the project remained in compliance with the Consent Order.

WESTON hereby formally requests a waiver of any violation of the Consent Order that may have occurred. In order to promote efficiency on this project, this request will be assumed to have been granted unless an objection is received within ten (10) days of receipt of this letter.

Thank you very much for your assistance and cooperation.

Very truly yours,

ROY F. WESTON, INC.

Carlos J. Serna, P.G.  
Senior Project Manager

cc: Henry Lopes, Techalloy  
Richard Perlick, Techalloy  
Jack Thorsen, WESTON  
Joseph M. Boyle, U.S. EPA





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD

CHICAGO, IL 60604-3590

FILE COPY

REPLY TO THE ATTENTION OF:

SQ-14J

MEMORANDUM

DATE: MAY 27 1994

SUBJECT: **Conditional Approval** of the Second Revision, Quality Assurance Project Plan (QAPP) for RCRA Facility Investigation (RFI) for the Techalloy Company, Inc., Union, Illinois

FROM: *Willie H. Harris*  
Willie H. Harris  
Regional Quality Assurance Manager

TO: Joseph Boyle, Chief  
RCRA Enforcement Branch

ATTENTION: William Buller, RCRA Project Coordinator

I am providing a **conditional approval** of the subject QAPP. The Quality Assurance Section (QAS) received the subject QAPP on April 28, 1994, (QAS Log-in No. R177).

The conditions for approval are: 1) correct the QAPP as stated below, and 2) the performance of a laboratory audit.

Correct the following tables:

1. Revise Tables 2-12.1 through 2-12.3 to include the IEPA's clean-up levels.
2. Revise Table 2-14 (Data Quality Objectives) to include the newly added analyses, SVOCs in soil; and ammonia, chloride, nitrate, and sulfate in groundwater.

The Contract Analytical Support Section (CASS) recommends that the laboratory, WESTON-Gulf Coast Laboratories, be audited for the following reasons:

1. The laboratory has not been audited in over two years and the analytical as well as quality assurance procedures may have changed during this time.
2. Written analytical and custody procedures, as provided in the QAPP, are appropriate. An on-site audit would confirm that they are being followed.

3. The IEPA's clean-up objective concentration levels are slightly lower than the laboratory's reporting limits, it is necessary to examine the laboratory's method detection limit (MDL) data for the analytical protocol being used for this project. The laboratory's MDLs are probably lower than their reporting limits.
4. An on-site audit is recommended to confirm that the laboratory has all of the necessary equipment.

An audit request form must be submitted to Dennis Wesolowski, Chief of the CASS of MQAB. If there are any questions regarding this memorandum, the Project Coordinator can contact Denise Boone of my staff.

I have signed the attached signature page. Please have the Project Coordinator provide final sign-off. We would like to receive a copy of the completed signature page within the next two weeks.

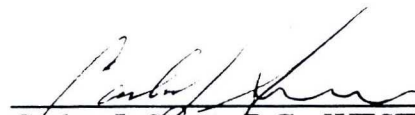
Attachment

cc: Michael DeRosa, HRE-8J

**FINAL QUALITY ASSURANCE PROJECT PLAN  
FOR THE  
RCRA FACILITY INVESTIGATION  
TECHALLOY COMPANY, INC.  
UNION, ILLINOIS**


March 1994

Prepared  
and  
Approved by:

  
Carlos J. Serna, P.G., WESTON  
Project Manager

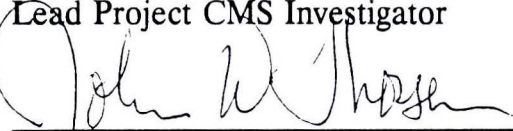
Date: 3/23/94

Approved by:

  
Robert H. Gilbertsen, P.E.  
Lead Project CMS Investigator

Date: 23 MARCH 94

Approved by:

  
John W. Thorsen, P.E., WESTON  
Project Director


Date: 28 March 1994

Approved by:

Raymond J. Frederici  
Laboratory Quality Assurance Manager

Date: \_\_\_\_\_

Approved by:

  
Henry Lopes, Techalloy Company, Inc.  
Vice President


Date: 3/28/94

Approved by:

William Buller, U.S. EPA  
RCRA Project Coordinator

Date: \_\_\_\_\_

Approved by:

  
Willie Harris, U.S. EPA  
Regional Quality Assurance Manager

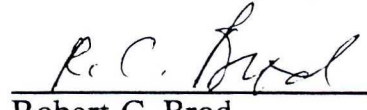
Date: 5/27/94

Approved by:

  
Charles Ellis, U.S. EPA Region V  
Director, Central Regional Laboratory

Date: \_\_\_\_\_

Approved by:

  
Robert C. Brod  
Quality Assurance Manager

Date: 3/23/94

## TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1	INTRODUCTION	1-1
2	PROJECT DESCRIPTION	2-1
2.1	Facility Location History and Background Information	2-1
2.2	Past Data Collection Activity and Current Status	2-15
2.3	Project Scope and Objectives	2-46
2.4	Sample Network Design and Rationale	2-48
2.5	Parameters to be Tested and Frequency	2-48.1
2.6	Data Quality Objectives	2-49
2.7	Project Schedule	2-54
3	PROJECT ORGANIZATION AND RESPONSIBILITIES	3-1
3.1	Project Management	3-1
3.1.1	U.S. EPA Region V RCRA Project Coordinator	3-1
3.1.2	WESTON Project Director	3-1
3.1.3	WESTON Project Manager	3-3
3.1.4	WESTON Project Personnel	3-3
3.1.5	Techalloy Project Director	3-4
3.2	Quality Assurance	3-4
3.2.1	Review and Approval of QAPP	3-4
3.2.2	Validation of Analytical Data	3-4
3.2.3	Performance and System Audits	3-5
3.2.4	Final Assessment of Quality Assurance Objectives	3-5
3.2.5	Evidence Audits of Field Records	3-5
3.2.6	Internal Quality Assurance Review	3-5
3.2.7	Approval of Laboratory Analytical Procedures	3-6
3.3	Field Operations	3-6
3.4	Laboratory Operations	3-7
3.4.1	Laboratory Project Director and Project Manager	3-7
3.4.2	Laboratory Manager	3-8
3.4.3	Laboratory Quality Assurance Personnel	3-9
3.4.4	Section Managers and Unit Leaders	3-9
3.4.5	Report Section Managers	3-10
3.4.6	Chemists and Technicians	3-10
3.4.7	Sampling Log-In Personnel	3-11
4	QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA	4-1
4.1	Level of Quality Control Effort	4-1
4.2	Accuracy, Precision, and Sensitivity of Analysis	4-3

## TABLE OF CONTENTS (CONTINUED)

<u>Section</u>	<u>Title</u>	<u>Page</u>
4.3	Completeness, Representativeness, and Comparability	4-5
5	SAMPLING PROCEDURES	5-1
6	SAMPLE CUSTODY	6-1
6.1	Field Chain-of-Custody Procedures	6-1
6.1.1	Field Procedures	6-1
6.1.2	Field Logbooks and Documentation	6-2
6.1.3	Transfer of Custody and Shipment Procedures	6-3
6.1.4	Summary of Field Chain-of-Custody Procedures	6-5
6.2	Laboratory Chain-of-Custody Procedures	6-10
6.2.1	Sample Receipt	6-12
6.2.2	Laboratory Sample Storage	6-13
6.2.3	Laboratory Sample Tracking	6-14
6.2.4	Sample Disposition	6-16
6.2.5	Laboratory Recordkeeping	6-16
6.2.6	Laboratory Building Security	6-17
6.3	Final Evidence File Custody Procedure	6-17
7	CALIBRATION PROCEDURES AND FREQUENCY	7-1
7.1	Field Instruments and Equipment	7-1
7.2	Laboratory Instruments	7-2
7.2.1	Inorganic Methods	7-3
7.2.2	Gas Chromatography/Mass Spectrometry	7-9
7.2.3	Gas Chromatography	7-10
8	ANALYTICAL PROCEDURES	8-1
8.1	Laboratory Analytical Procedures	8-1
8.2	Protocols for Screening Tests in the Field	8-8
9	INTERNAL QUALITY CONTROL CHECKS	9-1
9.1	Field Sample Collection	9-1
9.2	Quality Control of Field Measurements	9-1
9.3	Laboratory Internal Quality Control Checks	9-1
9.3.1	Method Performance QC Indicators	9-2
9.3.2	QC Indicators for Instrument Performance	9-6
9.3.3	Indicators for Method Performance	9-9

## TABLE OF CONTENTS (CONTINUED)

<u>Section</u>	<u>Title</u>	<u>Page</u>
	9.3.4 Refrigerator Blanks	9-10
	9.3.5 Solvent/Reagent Water Approval	9-10
	9.3.6 Balances and Refrigerators	9-11
	9.3.7 Instrument Time Check Verification	9-11
10	DATA REDUCTION, VALIDATION, AND REPORTING	10-1
10.1	Field Measurements	10-1
10.2	Laboratory Services	10-1
	10.2.1 Data Reduction	10-1
	10.2.2 Data Review/Data Reporting	10-2
	10.2.3 Data Validation	10-6
11	PERFORMANCE AND SYSTEM AUDITS	11-1
11.1	Field Audits	11-1
11.2	Laboratory Audits	11-1
12	PREVENTIVE MAINTENANCE	12-1
12.1	Field Equipment	12-1
12.2	Laboratory Equipment	12-1
	12.2.1 Instrument Maintenance Logbooks	12-2
	12.2.2 Instrument Maintenance and Repairs	12-2
	12.2.3 Spare Parts	12-3
	12.2.4 Contingency Parts	12-3
13	SPECIFIC ROUTINE PROCEDURES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS	13-1
13.1	Field Measurements	13-1
13.2	Laboratory Data	13-1
	13.2.1 Precision	13-1
	13.2.2 Accuracy	13-2
	13.2.3 Completeness	13-3
	13.2.4 Sensitivity	13-3
14	CORRECTIVE ACTIONS	14-1
14.1	Corrective Actions in the Field	14-1
14.2	Laboratory Corrective Actions	14-3
15	QUALITY ASSURANCE REPORTS TO MANAGEMENT	15-1

RECEIVED  
JUL 21 1994


QUALITY ASSURANCE SECTION  
ENVIRONMENTAL SCIENCES DIV.

**FINAL QUALITY ASSURANCE PROJECT PLAN  
FOR THE  
RCRA FACILITY INVESTIGATION  
TECHALLOY COMPANY, INC.  
UNION, ILLINOIS**

APR 1 1994

March 1994

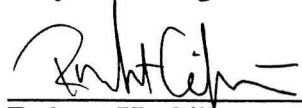
Prepared  
and  
Approved by:

  
Carlos J. Serna, P.G., WESTON  
Project Manager

Date:

3/23/94

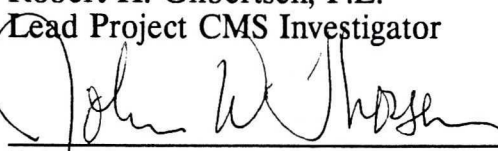
Approved by:

  
Robert H. Gilbertsen, P.E.  
Lead Project CMS Investigator

Date:

23 March 94

Approved by:

  
John W. Thorsen, P.E., WESTON  
Project Director

Date:


28 March 1994

Approved by:

Raymond J. Frederici  
Laboratory Quality Assurance Manager

Date:


Approved by:

  
Henry Lopes, Techalloy Company, Inc.  
Vice President

Date:

3/28/94


Approved by:

  
William Buller, U.S. EPA  
RCRA Project Coordinator

Date:

7/19/94

Approved by:

  
Willie Harris, U.S. EPA  
Regional Quality Assurance Manager

Date:


5/27/94

Approved by:

  
Charles Elly, U.S. EPA Region V  
Director, Central Regional Laboratory

Date:

Approved by:

  
Robert C. Brod  
Quality Assurance Manager

Date:

3/23/94

*The SOPs have  
been added to  
the QAPP.*

TO: William Buller, RCRA Project Coordinator,  
RCRA Enforcement Branch, OH/MN Technical Enf. Sec.

FROM: Patrick J. Churilla, Chemist,  
Contract Analytical Services Section

Dennis J. Wesolowski, Section Chief,  
Contract Analytical Services Section

SUBJECT: On-site Audit of Weston-Gulf Coast Laboratories for the  
Techalloy RCRA Facility Investigation

This report describes the findings of the recent USEPA audit of Weston-Gulf Coast Laboratories for the RCRA investigation being conducted at Techalloy Company, Inc. This audit was conducted on June 9-10, 1994 by EPA personnel, Patrick Churilla and Dennis Wesolowski.

The following Weston-Gulf Coast personnel were interviewed during the audit:

Ray Federici	Division Quality Assurance Manager
Donna McCarthy	QA Assistant
Paula Spaulding	Sample Receptionist
Dan Knierieman	Organic Extraction Specialist
Jody Wojcik	Inorganic Digestion Unit Leader
Rada Dobric	TCLP Specialist
Jeff James	Bottle Supply Officer
Ross Miller	ICP Analyst
Dan Smaga	GFAA Unit Leader
Cheryl Boyd	Mercury Analyst
Joan Klonowski	Cyanide Analyst
Janet Allen	Percent Solids Analyst
Marilyn Krueding	Volatiles Analyst (GC/MS)
Greg Goodwin	GC/MS BNA Unit Leader
Donna Koehlert	Volatiles Analyst (GC/FID)

The following instrumentation and equipment was observed at the laboratory:

1 Thermo Jarrel Ash ICP-61  
1 Thermo Jarrel Ash 1100  
3 Perkin-Elmer GFAA Zeeman 3030

- 1 Thermo Jarrel Ash Video 12E
- 1 Leeman PS200 - Mercury Analyzer
- 1 Spectronic 1001 - for Cyanide analysis
- 1 Spectronic 401 - for Sulfate analysis
- 1 48 Sample TCLP Extractor
- 2 Hewlett Packard GC/MS Model 5995 - for VOA
- 2 Hewlett Packard GC/MS Model 5970 - for BNA
- 1 Varian 3400 GC with Tekmar 4200 heated purge and trap

Weston - Gulf Coast Laboratories has the personnel, equipment and quality assurance procedures necessary for performing the analytical services required for the Techalloy project. For the BNA and Sulfate analyses this lab can be used without any changes. However, our audit produced several findings for the volatiles, metals and cyanide analyses which need to be addressed before we can fully recommend the use of this laboratory for this project. Our findings are divided into three parts; the first consists of minor technical issues which reflect good laboratory practices to avoid potential problems, the second consists of major technical issues which we feel the lab needs to address before sample analysis can begin and the third group lists Quality Assurance Project Plan issues which need to be resolved.

#### MINOR TECHNICAL ISSUES

1. The acid reagents are not tested before using. Commercially purchased reagents can be a significant source of metals contamination. We recommend that all Lots of reagents be tested before being used in the laboratory.
2. The analytical balance in the inorganic sample preparation area is not protected from drafts and other laboratory influences. We recommend that this balance be placed in a protective enclosure similar to the balance in the organic preparation area.
3. Contamination was observed in the semivolatile and the pesticide/PCB fractions of the example dataset provided by the laboratory. There were several early eluting tentatively identified compounds which shouldn't interfere with the analytes of interest in the semivolatile fraction. In the pesticide/PCB fraction, however, the contamination coelutes with several compounds of interest. Fortunately, for this project, pesticides and PCBs are not being measured. We have seen similar contamination in the past and it was due to dirty sodium sulfate.
4. Preservation of TCLP extracts is covered in Gulf Coast's SOPs by reference to SW-846 method 1311. However, we are concerned about the time between filtering of the TCLP extract and preservation; particularly for cyanide samples since cyanide is fairly volatile. We think that each sample should be preserved immediately after it is filtered instead of filtering a batch of samples then preserving them.

## MAJOR TECHNICAL ISSUES

This office recommends that the laboratory not be used until these recommendations are implemented.

1. The pH of all inorganic samples shall be checked at the time of receipt and all volatile samples shall be checked at the time of analysis. The lab should not rely on the Chain-of-Custody as evidence of preservation because the sampler may have preserved the sample incorrectly or switched bottles or the sample itself may alter the pH even if the sampler did everything correctly.

2. Clean-up objectives for several analytes were below the lab's reporting limits so examination of the laboratory's detection limits was necessary. For most of the analytes the laboratory's detection limits were satisfactory. However, due to the special requirements placed on many of the chlorinated hydrocarbons for toxicity purposes lower detection limits are necessary. To meet these limits we propose that EPA method 8010 be used. The lab provided their detection limits for method 8010 which were acceptable.

3. The cis- and trans- isomers of 1,2-dichloroethylene are currently being reported by the laboratory as total 1,2-dichloroethylene. The results for the individual isomers are needed for risk assessment purposes.

4. There is no homogenization of soil samples prior to taking a portion from the jar for metals analysis. The lab mixes the wet sample but does not dry and grind or sieve the soil to get a good representative sample and improve accuracy and precision. Though the objectives are only concerned with TCLP metals and not total metals the TCLP metals still need to have the particles broken into 3/8 inch pieces and sieved before the leaching procedure. This is required by method 1311. The homogenization aspect for total metals is a reproducibility question that should be considered for the site.

## QAPP ISSUES

1. The laboratory currently does not have an acceptable naming convention for multiple analyses/dilutions or multiple blanks within a dataset. The dataset that we examined had two blanks designated as SBLK1 and two dilutions of a sample with the same name. This makes it difficult to determine which blank is associated with which samples and which analysis was used to report the results for the sample.

Attached to this report are Weston-Gulf Coast's current method detection limits and SOP's which need to be added to the QAPjP. If you have any questions regarding this audit report please contact Dennis Wesolowski at 886-1970 or Patrick Churilla at 353-5210.

Weston-Gulf Coast, Inc.

1993 MDL Study

Method #: 601 - Waters

Instrument: 27

Analysis		Std.Conc.										Report	
Date	Parameter	(ug/l)	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev	MDL	Limit
10-14-93	Chloromethane	.80	.117	.304	.166	.170	.189	.126	.175	.178	.061	.19	0.8
10-14-93	Bromomethane	.80	.494	.637	.586	.336	.636	.355	.540	.512	.125	.39	0.8
10-14-93	Vinyl Chloride	.80	.207	.160	.185	.404	.165	.200	.323	.235	.093	.29	0.8
10-14-93	Chloroethane	.80	.407	.501	.408	.512	.490	.370	.374	.437	.062	.19	0.8
10-14-93	Methylene Chloride	.80	.488	.680	.614	.723	.663	.400	.466	.576	.124	.39	0.8
10-14-93	1,1-Dichloroethylene	.80	.523	.591	.589	.551	.505	.564	.491	.545	.040	.12	0.8
10-14-93	1,1-Dichloroethane	.80	.643	.604	.606	.600	.572	.579	.529	.590	.035	.11	0.8
10-14-93	t-1,2-Dichloroethylene	.80	.719	.611	.504	.589	.548	.550	.466	.570	.082	.26	0.8
10-14-93	Chloroform	.80	.538	.565	.574	.596	.581	.572	.536	.566	.022	.07	0.8
10-14-93	1,2-Dichloroethane	.80	.739	.754	.648	.722	.689	.663	.637	.693	.046	.14	0.8
10-14-93	1,1,1-trichloroethane	.80	.344	.342	.387	.409	.319	.295	.363	.351	.039	.12	0.8
10-14-93	Carbon Tetrachloride	.80	.656	.667	.607	.579	.599	.584	.592	.612	.035	.11	0.8
10-14-93	Bromodichloromethane	.80	.671	.634	.659	.587	.626	.618	.602	.628	.030	.09	0.8
10-14-93	1,2-Dichloropropane	.80	.594	.547	.573	.546	.518	.536	.541	.551	.025	.08	0.8
10-14-93	c-1,3-Dichloropropylene	.80	.636	.561	.578	.525	.516	.536	.542	.556	.041	.13	0.8
10-14-93	Trichloroethylene	.80	.565	.516	.444	.454	.688	.442	.515	.518	.088	.28	0.8
10-14-93	Chlorodibromomethane	.80	.609	.544	.589	.489	.550	.503	.548	.547	.043	.13	0.8
10-14-93	1,1,2-trichloroethane	.80	.670	.611	.605	.586	.574	.563	.608	.602	.035	.11	0.8
10-14-93	t-1,3-Dichloropropylene	.80	.590	.457	.473	.449	.437	.434	.438	.468	.055	.17	0.8
10-14-93	Bromoform	.80	.328	.282	.360	.204	.327	.320	.297	.303	.050	.16	0.8
10-14-93	Tetrachloroethylene	.80	.624	.383	.397	.356	.316	.362	.381	.403	.101	.32	0.8
10-14-93	1,1,2,2-tetrachloroethane	.80	.831	.547	.534	.539	.492	.496	.549	.570	.118	.37	0.8
10-14-93	Chlorobenzene	.80	.394	.186	.192	.187	.150	.167	.178	.208	.083	.26	0.8
10-14-93	1,3-Dichlorobenzene	.80	.488	.259	.260	.266	.225	.273	.284	.294	.088	.28	0.8
10-14-93	1,2-Dichlorobenzene	.80	.514	.314	.288	.301	.272	.277	.304	.324	.085	.27	0.8
10-14-93	1,4-Dichlorobenzene	.80	.612	.347	.358	.346	.311	.374	.369	.388	.101	.32	0.8
10-14-93	2-Chloroethylvinylether	.80	.435	.363	.292	.314	.315	.257	.313	.327	.057	.18	0.8
10-14-93	Dichlorodifluoromethane	.80	.593	.510	.636	.811	.339	.535	.282	.529	.179	.56	0.8
10-14-93	Trichlorofluoromethane	.80	.340	.226	.356	.314	.356	.359	.368	.331	.050	.16	0.8

## NESTON-Gulf Coast, Inc.

1994 MDL Study

Method #: 601 - Waters (Heated Purge)

Instrument: 27

Analysis		Std.Conc.										Report	
Date	Parameter	(ug/l)	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev	MDL	Limit
01-11-94	Chloromethane	.80	.271	.239	.234	.214	.109	.121	.244	.205	.064	.20	0.8
01-11-94	Bromomethane	.80	.555	.239	.346	.456	.595	.315	.371	.411	.130	.41	0.8
01-11-94	Vinyl Chloride	.80	.365	.279	.308	.244	.124	.152	.283	.251	.086	.27	0.8
01-11-94	Chloroethane	.80	.458	.422	.406	.435	.246	.199	.414	.369	.102	.32	0.8
01-11-94	Methylene Chloride	.80	.508	.449	.448	.450	.259	.249	.435	.400	.102	.32	0.8
01-11-94	1,1-Dichloroethylene	.80	.680	.747	.697	.745	.505	.502	.732	.658	.109	.34	0.8
01-11-94	1,1-Dichloroethane	.80	.497	.466	.469	.452	.301	.297	.484	.424	.086	.27	0.8
01-11-94	t-1,2-Dichloroethylene	.80	.466	.422	.452	.441	.297	.290	.452	.403	.076	.24	0.8
01-11-94	Chloroform	.80	.582	.551	.549	.546	.388	.371	.591	.511	.092	.29	0.8
01-11-94	1,2-Dichloroethane	.80	.537	.616	.662	.580	.616	.646	.611	.610	.041	.13	0.8
01-11-94	1,1,1-trichloroethane	.80	.620	.722	.776	.846	.839	.763	.828	.771	.080	.25	0.8
01-11-94	Carbon Tetrachloride	.80	.656	.632	.638	.629	.448	.430	.669	.586	.102	.32	0.8
01-11-94	Bromodichloromethane	.80	.545	.552	.561	.523	.368	.360	.578	.498	.093	.29	0.8
01-11-94	1,2-Dichloropropane	.80	.643	.605	.596	.587	.408	.398	.637	.553	.105	.33	0.8
01-11-94	c-1,3-Dichloropropylene	.80	.541	.509	.531	.501	.359	.362	.548	.479	.082	.26	0.8
01-11-94	Trichloroethylene	.80	.560	.540	.525	.521	.379	.352	.548	.489	.086	.27	0.8
01-11-94	Chlorodibromomethane	.80	.551	.572	.532	.521	.362	.318	.604	.494	.110	.34	0.8
01-11-94	1,1,2-trichloroethane	.80	.593	.591	.552	.565	.411	.435	.526	.525	.073	.23	0.8
01-11-94	t-1,3-Dichloropropylene	.80	.469	.460	.487	.480	.342	.329	.462	.433	.067	.21	0.8
01-11-94	Bromoform	.80	.305	.286	.248	.275	.154	.113	.337	.245	.082	.26	0.8
01-11-94	Tetrachloroethylene	.80	.664	.673	.599	.688	.408	.384	.659	.582	.130	.41	0.8
01-11-94	1,1,2,2-tetrachloroethane	.80	.647	.665	.874	.664	.529	.540	.704	.660	.115	.36	0.8
01-11-94	Chlorobenzene	.80	.720	.611	.746	.657	.427	.369	.705	.605	.149	.47	0.8
01-11-94	1,3-Dichlorobenzene	.80	.457	.455	.446	.415	.251	.254	.458	.391	.096	.30	0.8
01-11-94	1,2-Dichlorobenzene	.80	.532	.515	.485	.480	.299	.280	.534	.446	.109	.34	0.8
01-11-94	1,4-Dichlorobenzene	.80	.543	.544	.535	.496	.309	.309	.555	.470	.112	.35	0.8
01-11-94	2-Chloroethylvinylether	.80	.476	.381	.456	.416	.272	.292	.482	.396	.086	.27	0.8
01-11-94	Dichlorodifluoromethane	.80	.420	.254	.144	.293	.259	.303	.260	.276	.082	.26	0.8
01-11-94	Trichlorofluoromethane	.80	.509	.461	.464	.481	.297	.293	.480	.426	.091	.29	0.8

WESTON-Gulf Coast, Inc.

1994 MDL Study

Method #: 601 - Waters

Instrument: 27

Analysis		Std.Conc.										Report	
Date	Parameter	(ug/l)	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev	MDL	Limit
03/20/94	c-1,2-Dichloroethene	.80	.897	.827	.821	.826	.863	.825	.857	.845	.028	.09	1.0

WESTON-Gulf Coast, Inc.  
1994 MDL Study

Method #: 601 - Waters  
Instrument: 17

Analysis		Std.Conc.								Report			
Date	Parameter	(ug/l)	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev	MDL	Limit
05-26-94	Vinyl Chloride	.20	.203	.187	.186	.238	.250	.240	.179	.212	.030	.09	.8
05-26-94	1,2-Dichloroethane	.20	.252	.277	.268	.289	.290	.305	.277	.280	.017	.05	.8

## Weston-Gulf Coast, Inc.

GC/MS Volatile Method SW846-8240 &amp; Appendix IX List Soil MDL Study: Instrument 06

Analysis Date: 01/03/94

Compound	Std.Conc. (ng/ml)	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev.	MDL	Limit
Chloromethane	10	6.03	6.58	7.21	6.70	7.50	6.63	6.36	6.72	.50	1.6	10
Bromomethane	10	4.71	5.12	4.20	5.15	4.33	4.20	8.34	5.15	1.46	4.6	10
Vinyl Chloride	10	7.66	8.52	7.63	8.36	7.66	6.91	5.94	7.53	.88	2.8	10
Chloroethane	10	7.32	8.05	6.96	7.44	7.29	6.35	6.80	7.17	.54	1.7	10
Methylene Chloride	10	8.82	9.80	9.38	9.45	9.22	9.01	8.65	9.19	.40	1.2	5
Acetone	10	10.7	4.6	7.9	8.9	12.2	9.0	10.8	9.15	2.47	7.8	10
Carbon Disulfide	10	8.54	10.30	8.92	9.03	8.67	8.04	7.18	8.67	.96	3.0	5
1,1-Dichloroethene	10	8.77	9.63	8.78	8.78	8.44	8.13	7.18	8.53	.75	2.4	5
1,1-Dichloroethane	10	9.23	10.60	9.82	9.88	9.55	9.16	8.73	9.57	.61	1.9	5
1,2-Dichloroethene (total)	10	16.9	19.8	18.4	18.5	18.1	18.6	15.9	18.03	1.27	4.0	5
Chloroform	10	9.47	10.30	9.88	9.67	9.48	9.38	8.78	9.57	.47	1.5	5
1,2-Dichloroethane	10	9.24	9.53	9.43	9.70	9.01	9.76	9.75	9.49	.28	.9	5
2-Butanone	10	9.16	3.91	6.71	7.61	7.96	8.15	12.40	7.99	2.56	8.0	10
1,1,1-Trichloroethane	10	9.37	9.02	9.25	9.24	8.74	9.15	8.27	9.01	.38	1.2	5
Carbon Tetrachloride	10	9.11	8.83	9.04	8.96	8.43	8.82	7.88	8.72	.43	1.4	5
Vinyl Acetate	10	8.72	5.81	8.52	7.97	7.87	9.25	10.10	8.32	1.35	4.2	10
Bromodichloromethane	10	8.41	8.29	8.94	8.87	8.91	9.08	9.14	8.81	.33	1.0	5
1,2-Dichloropropane	10	9.83	9.55	9.95	9.79	9.90	9.22	9.43	9.67	.27	.9	5
cis-1,3-Dichloropropene	10	9.05	8.78	9.47	9.28	9.33	9.63	9.86	9.34	.36	1.1	5
Trichloroethene	10	9.69	9.87	9.84	9.98	9.85	9.86	9.53	9.80	.15	.5	5
Dibromochloromethane	10	7.97	7.15	8.23	8.06	8.60	8.79	8.82	8.23	.59	1.8	5
1,1,2-Trichloroethane	10	9.05	7.61	9.02	9.07	9.30	9.83	10.40	9.18	.86	2.7	5
Benzene	10	9.68	9.83	9.71	9.92	9.23	10.10	9.88	9.76	.27	.9	5
trans-1,3-Dichloropropene	10	8.81	8.21	9.01	8.93	8.94	9.18	9.47	8.94	.39	1.2	5
Chloroform	10	7.86	5.83	7.88	7.69	8.21	8.55	8.68	7.81	.95	3.0	5
4-Methyl-2-pentanone	10	8.07	3.81	6.97	7.10	7.48	7.98	9.05	7.21	1.65	5.2	10
2-Hexanone	10	8.34	3.31	6.42	6.76	7.19	7.48	8.48	6.85	1.74	5.5	10
Tetrachloroethene	10	9.84	10.20	10.00	10.30	9.78	9.41	9.30	9.83	.38	1.2	5
1,1,2,2-Tetrachloroethane	10	8.56	5.81	8.16	7.79	8.54	9.02	9.84	8.25	1.26	3.9	5
Toluene	10	9.52	9.71	9.68	9.54	9.28	9.27	8.96	9.42	.27	.8	5
Chlorobenzene	10	9.52	9.65	9.80	9.52	9.52	9.56	9.36	9.56	.14	.4	5
Ethylbenzene	10	9.65	9.68	9.66	9.46	9.40	9.08	8.80	9.39	.34	1.1	5
Styrene	10	9.15	9.18	9.43	9.30	9.20	9.18	9.09	9.22	.11	.4	5
Xylene (total)	10	9.94	10.10	9.99	9.90	9.67	9.71	9.44	9.82	.23	.7	5
Acrolein	200	125.0	72.4	116.0	106.0	138.0	161.0	119.0	119.63	27.4	86.1	500
Acrylonitrile	40	29.4	15.5	23.9	25.8	26.5	26.8	30.7	25.51	4.96	15.6	100
Trichlorofluoromethane	10	8.08	9.63	7.99	8.33	7.78	7.25	7.39	8.06	.79	2.5	10
Dichlorodifluoromethane	10	6.18	6.76	6.65	6.58	6.35	9.56	4.30	6.63	1.54	4.9	20
Acetonitrile	10	64.8	65.4	63.9	66.0	64.2	61.5	45.9	61.67	7.10	22.3	100
Iodomethane	25	19.7	23.6	19.3	20.8	19.0	19.7	20.5	20.37	1.56	4.9	10
Propionitrile	10	30.8	10.6	21.3	21.6	23.6	23.8	30.2	23.13	6.74	21.2	50
3-Chloropropene	25	21.8	24.6	22.7	22.8	22.9	21.1	21.8	22.53	1.13	3.5	10
Methacrylonitrile	25	18.1	14.8	18.4	19.2	19.4	19.8	21.0	18.67	1.95	6.1	20
Dibromomethane	25	20.9	18.0	21.3	21.3	22.1	22.7	24.3	21.51	1.93	6.1	20
Isobutyl alcohol	1000	360.0	165.0	420.0	447.0	429.0	549.0	600.0	424.3	140.4	441	2000
1,2-Dibromoethane	25	19.3	15.3	19.2	19.3	20.3	20.9	22.8	19.59	2.28	7.2	20
1,1,1,2-Tetrachloroethane	25	20.0	19.8	20.5	20.3	20.2	20.4	20.9	20.30	.36	1.1	10
1,2,3-Trichloropropane	25	17.7	10.6	15.8	15.5	16.8	17.7	19.8	16.27	2.88	9.1	10
trans-1,4-Dichloro-2-butene	25	16.6	9.3	14.8	14.2	15.6	16.2	15.4	14.58	2.47	7.8	20
1,2-Dibromo-3-chloropropane	25	15.3	6.9	12.6	11.9	14.1	14.7	15.9	13.05	3.07	9.7	20
Methylmethacrylate	25	19.2	12.7	17.8	18.5	19.3	20.0	23.6	18.73	3.24	10.2	20
Ethylmethacrylate	25	19.2	13.5	18.4	18.4	18.7	19.9	21.7	18.54	2.51	7.9	20
Pentachloroethane	25	19.0	18.0	19.8	18.4	19.4	19.8	19.3	19.10	.69	2.2	20

## Weston-Gulf Coast, Inc.

GC/MS Volatile Method SW846-8240 Soil MDL Study: Instrument 2

Analysis Date: 01-20-93

Compound	Std.Conc.	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev.	MDL	Limit
	(ng/ml)											
Chloromethane	20.00	14.86	20.57	15.71	20.25	22.34	16.83	19.45	18.57	2.79	8.8	10
Bromomethane	20.00	32.03	35.40	57.85	44.92	36.29	53.22	41.77	43.07	9.60	30.2	10
Vinyl Chloride	20.00	16.41	22.53	16.65	21.12	23.89	22.11	20.05	20.39	2.89	9.1	10
Dichlorodifluoromethane	20.00	15.03	16.96	21.67	11.23	13.36	15.63	14.91	15.54	3.26	10.2	
Chloroethane	20.00	22.17	16.34	20.77	23.07	24.05	22.09	24.74	21.89	2.78	8.7	10
Methylene Chloride	20.00	23.07	18.00	16.62	22.11	24.25	24	25.95	22.00	3.43	10.8	5
Acrolein	200.00	327.61	285.72	282.69	240.95	335.35	325.54	370.70	309.79	42.78	134.5	
Acetone	20.00	23.21	24.69	30.27	25.48	29.25	35.54	34.40	28.98	4.80	15.1	10
Carbon Disulfide	20.00	15.24	21.34	16.44	18.67	23.15	20.75	19.52	19.30	2.77	8.7	5
Trichlorofluoromethane	20.00	16.84	14.05	22.52	17.26	23.19	21.44	25.08	20.05	4.03	12.7	
Acrylonitrile	40.00	34.31	34.02	28.42	37.67	31.68	34.39	36.73	33.89	3.10	9.7	
Acetonitrile	40.00	44.86	40.11	37.93	49.45	40.47	49.64	50.16	44.66	5.19	16.3	
1,1-Dichloroethene	20.00	21.25	16.69	19.01	23.30	21.47	19.26	22.65	20.52	2.32	7.3	5
1,1-Dichloroethane	20.00	22.21	18.01	20.35	24.42	22.19	21.6	23.5	21.75	2.10	6.6	5
1,2-Dichloroethene	20.00	30.09	30.83	35.85	29.91	40.08	43.78	42.87	36.20	6.09	19.2	5
Chloroform	20.00	22.19	18.07	20.78	24.43	22.05	22.27	23.49	21.90	2.05	6.4	5
2-Butanone	20.00	14.83	16.69	19.97	17.40	15.93	21.67	22.76	18.46	3.03	9.5	10
1,2-Dichloroethane	20.00	14.97	15.99	22.22	18.55	16.05	21.20	22.28	18.75	3.16	9.9	5
Propionitrile	40.00	33.17	27.85	30.35	29.65	36.68	32.81	36.16	32.38	3.31	10.4	
1,1,1-Trichloroethane	20.00	22.98	19.22	22.33	27.76	25.47	25.39	26.40	24.22	2.90	9.1	5
Carbon Tetrachloride	20.00	21.92	18.15	25.21	20.90	24.92	22.77	23.15	22.43	2.43	7.6	5
Vinyl Acetate	20.00	19.79	16.77	19.53	23.77	21.45	22.64	22.71	20.95	2.41	7.6	10
Bromodichloromethane	20.00	21.67	18.12	22.02	24.65	21.91	23.3	23.72	22.20	2.10	6.6	5
1,2-Dichloropropane	20.00	21.77	18.34	21.94	24.20	21.5	22.74	23.36	21.98	1.87	5.9	5
cis-1,3-Dichloropropene	20.00	21.53	17.87	21.23	23.48	20.87	22.77	22.08	21.40	1.80	5.7	5
Trichloroethene	20.00	21.76	18.19	20.79	23.25	21.08	21.77	22.38	21.32	1.60	5.0	5
Dibromochloromethane	20.00	21.02	17.79	21.24	23.36	20.82	23.31	21.82	21.34	1.88	5.9	5
1,1,2-Trichloroethane	20.00	21.36	17.84	21.92	23.93	21.24	23.09	22.53	21.70	1.95	6.1	5
Benzene	20.00	21.64	17.96	21.28	24.02	21.69	21.85	23.51	21.71	1.95	6.1	5
trans-1,3-Dichloropropene	20.00	21.00	17.74	20.74	22.84	20.30	22.45	21.32	20.91	1.67	5.2	5
2-Chloroethylvinylether	20.00	13.32	15.57	17.18	16.95	17.33	18.47	17.2	17.12	.93	2.9	
Bromoform	20.00	19.47	16.72	20.09	21.77	19.50	22.57	19.76	19.98	1.87	5.9	5
Crotonitrile	40.00	29.10	19.76	23.06	24.20	21.39	28.28	26.99	24.68	3.55	11.2	
4-Methyl-2-Pentanone	20.00	19.50	16.19	22.03	26.30	23.65	24.26	24.92	22.41	3.50	11.0	10
2-Hexanone	20.00	20.19	17.69	23.47	28.68	25.60	26.07	26.98	24.10	3.92	12.3	10
Tetrachloroethene	20.00	21.95	17.76	21.27	25.13	21.66	21.46	24.46	21.96	2.41	7.6	5
1,1,2,2-Tetrachloroethane	20.00	19.93	16.90	21.82	24.89	22.50	23.86	23.73	21.95	2.75	8.6	5
Toluene	20.00	22.21	18.12	21.65	25.35	22.65	22.43	24.72	22.45	2.35	7.4	5
Chlorobenzene	20.00	21.73	18.20	21.41	24.29	21.41	22.36	23.27	21.81	1.91	6.0	5
Ethylbenzene	20.00	22.06	18.07	20.77	24.12	21.06	22.23	23.43	21.68	1.99	6.2	5
Styrene	20.00	21.84	17.94	20.71	23.59	20.67	21.94	21.91	21.23	1.75	5.5	5
Xylene (Total)	20.00	22.20	18.62	20.98	24.48	21.53	22.4	23.42	21.95	1.87	5.9	5

## Weston-Gulf Coast Laboratories, Inc.

GC/MS Volatile Method 8240 Soil MDL Study: Instrument 7

Analysis Date: 01-06-93

Compound	Std.Conc. (ng/ml)	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev.	MDL	Limit
Chloromethane	20.00	17.72	18.99	16.21	15.90	18.78	18.24	18.62	17.78	1.25	3.9	10
Vinyl Chloride	20.00	19.15	20.11	18.53	19.46	20.63	19.85	20.47	19.74	.75	2.4	10
Bromomethane	20.00	20.29	20.25	19.32	19.61	20.68	19.79	20.55	20.07	.51	1.6	10
Chloroethane	20.00	20.64	21.11	19.78	20.23	21.91	21.46	21.58	20.96	.77	2.4	10
1,1-Dichloroethene	20.00	21.11	20.81	19.61	20.60	21.36	20.73	21.28	20.79	.59	1.9	5
Acetone	20.00	29.41	31.71	34.51	29.20	35.37	35.82	33.81	32.83	2.75	8.6	10
Carbon Disulfide	20.00	20.67	20.60	19.59	20.32	21.32	20.63	21.09	20.60	.56	1.8	5
Methylene Chloride	20.00	21.87	22.52	21.13	21.13	22.00	21.58	22.00	21.75	.50	1.6	5
1,2-Dichloroethene	20.00	20.68	20.85	19.43	20.34	21.68	21.03	21.04	20.72	.70	2.2	5
1,1-Dichloroethane	20.00	20.69	21.07	20.04	20.58	21.80	21.19	21.90	21.04	.67	2.1	5
Vinyl Acetate	20.00	20.79	20.07	21.73	23.76	22.30	20.71	23.19	21.79	1.37	4.3	10
2-Butanone	20.00	16.16	19.69	16.48	19.50	21.28	21.67	15.42	18.60	2.55	8.0	10
Chloroform	20.00	20.58	20.64	19.58	20.12	21.37	20.55	21.60	20.63	.69	2.2	5
1,1,1-Trichloroethane	20.00	19.98	16.95	17.91	18.04	18.31	17.97	18.24	18.20	.90	2.8	5
Carbon Tetrachloride	20.00	19.87	19.57	18.93	19.51	20.41	20.07	21.18	19.93	.72	2.3	5
Benzene	20.00	21.10	20.85	19.96	20.46	21.78	20.78	21.64	20.94	.64	2.0	5
1,2-Dichloroethane	20.00	20.52	21.13	20.21	20.82	21.72	20.86	22.34	21.09	.73	2.3	5
Trichloroethene	20.00	20.83	20.45	19.69	20.39	21.62	20.62	22.26	20.84	.85	2.7	5
1,2-Dichloropropane	20.00	20.86	20.76	19.88	20.66	21.90	20.96	21.67	20.96	.67	2.1	5
Bromodichloromethane	20.00	20.34	20.38	19.67	20.23	21.22	20.41	21.68	20.56	.67	2.1	5
Cis-1,3-Dichloropropene	20.00	20.91	20.78	19.95	20.48	21.44	20.59	21.67	20.83	.58	1.8	5
4-Methyl-2-Pentanone	20.00	21.29	21.36	22.33	25.37	24.48	22.40	23.80	23.00	1.57	4.9	10
Toluene	20.00	20.80	20.43	19.49	19.53	20.84	20.06	20.55	20.24	.56	1.8	5
trans-1,3-Dichloropropene	20.00	20.08	19.97	19.28	19.98	20.89	20.03	21.11	20.19	.62	1.9	5
1,1,2-Trichloroethane	20.00	20.94	21.11	20.22	21.16	21.89	20.64	22.45	21.20	.75	2.4	5
Tetrachloroethene	20.00	20.75	20.23	19.35	19.65	21.03	20.04	21.01	20.29	.66	2.1	5
2-Hexanone	20.00	22.25	22.71	22.40	24.53	21.41	24.07	23.33	22.96	1.09	3.4	10
Dibromochloromethane	20.00	20.15	20.43	19.83	20.70	21.30	20.43	21.88	20.67	.70	2.2	5
Chlorobenzene	20.00	20.66	20.25	19.55	19.98	21.12	20.24	21.04	20.41	.57	1.8	5
Ethylbenzene	20.00	21.08	20.34	19.62	19.82	21.00	20.20	21.19	20.46	.63	2.0	5
Xylene (Total)	20.00	18.84	17.90	14.99	18.03	18.65	18.12	18.59	17.87	1.32	4.1	5
Styrene	20.00	21.38	21.07	20.12	20.52	21.67	20.93	21.13	20.97	.52	1.6	5
Bromoform	20.00	19.84	20.58	19.98	21.00	21.52	19.94	21.87	20.68	.81	2.6	5
1,1,2,2-Tetrachloroethane	20.00	20.75	21.33	20.79	22.38	22.66	21.15	23.00	21.72	.93	2.9	5

## WESTON-Gulf Coast, Inc.

GC/MS Semivolatile CLP OLM01.8 MDL Study: Instrument 01

Extraction Method: 3520 - Soil Matrix (Calculated from the Water MDL's)

Analysis Date: 02-01-94

Compound	Std.Conc. (ug/L)								Average	Std.Dev.	Report	
		MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7			MDL	Limit
Phenol	330	246.8	213.2	279.2	274.2	231.7	279.8	268.0	256.1	26.1	82.1	330
Bis(2-chloroethyl)ether	330	238.3	213.2	260.7	267.3	225.1	255.8	248.2	244.1	19.7	61.8	330
2-chlorophenol	330	237.6	205.9	268.6	269.3	219.5	259.4	242.2	243.2	24.4	76.7	330
1,3-Dichlorobenzene	330	194.0	167.6	222.4	216.8	171.6	221.1	209.9	200.5	23.2	72.8	330
1,4-Dichlorobenzene	330	202.6	183.2	231.7	229.7	181.8	229.7	214.5	210.4	21.7	68.3	330
1,2-Dichlorobenzene	330	205.9	177.5	230.3	226.1	181.5	222.4	212.2	208.0	21.2	66.5	330
2-methylphenol	330	241.6	211.9	278.5	276.5	227.0	276.5	250.1	251.7	26.6	83.7	330
Bis(2-chloroisopropyl)ether	330	307.2	278.9	372.9	379.5	321.1	366.3	346.5	338.9	37.7	118.6	330
4-Methylphenol	330	233.3	201.3	287.4	277.9	231.3	279.2	251.5	251.7	31.6	99.5	330
n-nitroso-di-n-propylamine	330	258.4	219.8	298.3	303.6	270.6	316.8	291.1	279.8	33.0	103.9	330
Hexachloroethane	330	175.6	144.5	196.7	194.0	164.0	201.0	195.7	181.6	21.1	66.4	330
Nitrobenzene	330	246.8	219.8	286.4	285.8	258.7	283.1	263.3	263.4	24.6	77.2	330
Isophorone	330	255.4	228.4	285.1	287.1	261.0	272.6	256.1	263.7	20.3	63.7	330
2-Nitrophenol	330	235.0	195.4	267.6	273.9	235.3	274.6	247.5	247.0	28.5	89.4	330
2,4-Dimethylphenol	330	194.0	168.6	224.4	224.7	198.0	219.1	180.2	201.3	22.3	70.0	330
Bis(2-chloroethoxy)methane	330	248.8	216.5	274.6	285.8	248.2	266.0	256.7	256.6	22.4	70.3	330
2,4-Dichlorophenol	330	228.0	187.8	251.1	253.1	225.1	247.5	218.5	230.2	23.2	72.9	330
1,2,4-Trichlorobenzene	330	203.9	188.8	213.2	226.1	199.0	224.4	212.5	209.7	13.5	42.4	330
Naphthalene	330	238.3	205.9	260.7	264.0	231.3	255.4	239.6	242.2	20.2	63.5	330
4-Chloroaniline	330	192.7	158.4	196.7	180.8	200.6	219.1	194.0	191.8	18.7	58.7	330
Hexachlorobutadiene	330	171.3	161.0	187.4	190.7	185.5	201.0	201.0	185.4	14.8	46.5	330
2-Chloro-3-methylphenol	330	256.1	228.4	283.8	296.3	273.9	281.8	262.7	269.0	22.4	70.4	330
2-methylnaphthalene	330	238.6	201.3	260.4	271.9	238.6	252.8	241.6	243.6	22.4	70.4	330
Hexachlorocyclopentadiene	330											330
2,4,6-Trichlorophenol	330	258.1	221.8	269.9	284.8	247.2	276.2	252.8	258.7	21.0	66.0	330
2,4,5-Trichlorophenol	330	257.4	204.3	271.9	266.0	240.2	267.3	230.0	248.2	24.7	77.5	825
2-Chloronaphthalene	330	238.9	203.9	248.5	257.1	231.7	254.4	225.1	237.1	18.7	58.9	330
2-Nitroaniline	330	249.2	214.2	305.3	313.2	271.9	324.1	287.1	280.7	38.9	122.2	825
Dimethylphthalate	330	248.8	231.7	273.6	272.6	257.4	264.0	240.9	255.6	15.9	50.0	330
Acenaphthylene	330	248.2	223.7	263.0	271.9	253.4	268.3	246.8	253.6	16.4	51.4	330
2,6-Dinitrotoluene	330	215.8	190.1	254.8	263.7	244.2	252.8	218.5	234.3	26.7	83.8	330
3-Nitroaniline	330	203.3	190.7	228.4	236.9	229.7	261.4	221.1	224.5	22.9	72.1	825
Acenaphthene	330	266.6	238.3	273.9	283.1	260.7	283.8	251.5	265.4	16.7	52.6	330
2,4-Dinitrophenol	330	125.4	114.8	205.9	203.3	161.0	244.2	196.4	178.7	46.9	147.3	825
4-Nitrophenol	330	215.5	179.2	249.5	271.3	235.0	283.1	246.2	240.0	34.9	109.6	825
Dibenzofuran	330	250.8	229.7	266.0	273.9	252.1	267.6	245.5	255.1	15.2	47.9	330
2,4-Dinitrotoluene	330	227.0	207.9	263.3	263.3	249.5	281.2	240.2	247.5	24.8	77.8	330
Diethylphthalate	330	258.7	239.6	278.5	282.5	271.3	282.5	251.5	266.4	16.8	52.7	330
4-Chlorophenyl-phenylether	330	253.4	229.7	261.7	275.2	252.5	271.3	245.9	255.7	15.5	48.8	330
Fluorene	330	249.5	232.3	272.9	271.6	259.7	274.6	242.2	257.5	16.7	52.3	330
4-Nitroaniline	330	233.0	196.7	242.2	255.4	238.9	277.2	248.8	241.7	24.5	77.1	825
4,6-Dinitro-2-methylphenol	330	172.6	139.6	255.4	251.8	234.3	275.6	220.4	221.4	48.7	153.2	825
n-Nitrosodiphenylamine	330	232.3	229.7	254.1	264.0	262.4	260.0	235.6	248.3	15.2	47.6	330
4-Bromophenyl-phenylether	330	261.7	243.5	271.3	287.4	271.3	279.8	267.3	268.9	14.0	43.9	330
Hexachlorobenzene	330	266.6	255.4	283.1	301.0	292.4	293.0	270.6	280.3	16.5	52.0	330
Pentachlorophenol	330	275.2	241.2	311.5	329.3	294.7	322.1	282.5	293.8	30.6	96.1	825
Phenanthrene	330	252.1	239.9	272.9	282.5	274.6	275.9	258.7	265.2	15.3	48.2	330
Anthracene	330	247.5	238.6	260.7	281.5	264.0	266.6	247.5	258.1	14.5	45.7	330
Carbazole	330	291.7	287.8	304.3	313.5	312.8	306.2	301.0	302.5	9.8	30.9	330
Di-n-butylphthalate	330	271.9	251.5	282.5	294.4	292.1	287.8	271.6	278.8	15.0	47.3	330
Fluoranthene	330	268.0	256.1	286.4	298.0	296.0	293.7	278.5	282.4	15.8	49.5	330
Pyrene	330	248.8	227.7	265.0	268.0	265.3	266.0	252.8	256.2	14.6	45.8	330

WESTON-Gulf Coast, Inc.  
 GC/MS Semivolatile CLP OLM01.8 MDL Study: Instrument 01  
 Extraction Method: 3520 - Soil Matrix (Calculated from the Water MDL's)  
 Analysis Date: 02-01-94

Compound	Std.Conc. (ug/L)										Report	
		MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev.	MDL	Limit
Butylbenzylphthalate	330	251.8	228.7	257.1	258.7	262.7	267.3	248.2	253.5	12.7	39.8	330
3,3-Dichlorobenzidine	330	207.2	206.6	202.3	198.3	249.5	226.4	237.6	218.3	19.7	61.9	330
Benzo(a)anthracene	330	265.7	251.5	266.6	269.9	274.9	271.9	268.0	266.9	7.5	23.6	330
Chrysene	330	269.3	243.5	277.5	283.1	289.1	287.8	265.7	273.7	16.0	50.2	330
Bis(2-ethylhexyl)phthalate	330	255.4	234.0	261.7	270.3	264.7	268.0	251.5	257.9	12.5	39.2	330
Di-n-octylphthalate	330	281.2	256.1	277.2	281.8	295.7	288.4	288.4	281.3	12.7	39.8	330
Benzo(b)fluoranthene	330	316.1	297.3	316.1	317.5	317.5	329.7	324.7	317.0	10.1	31.7	330
Benzo(k)fluoranthene	330	283.1	248.2	287.4	312.5	314.8	297.0	275.9	288.4	22.9	72.1	330
Benzo(a)pyrene	330	276.9	253.8	277.9	293.7	296.3	285.8	282.5	281.0	14.1	44.3	330
Indeno(1,2,3-CD)Pyrene	330	285.1	264.0	299.0	301.6	302.9	269.6	244.9	281.0	22.3	69.9	330
Dibenzo(a,h)anthracene	330	283.8	252.1	298.3	288.4	299.6	268.0	238.9	275.6	23.4	73.5	330
Benzo(g,h,i)perylene	330	284.1	268.6	302.9	305.9	301.0	261.0	240.2	280.5	24.9	78.3	330

## WESTON-Gulf Coast, Inc.

GC/MS Semivolatile CLP OLM01.8 MDL Study: Instrument 04

Extraction Method: 3520 - Soil Matrix (Calculated from the Water MDL's)

Analysis Date: 02/04/94

Compound	Std. Conc. (ug/kg)								Average	Std.Dev.	Report	
		MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7			MDL	Limit
Phenol	330	221.8	184.5	246.8	241.6	199.7	232.3	220.1	221.0	22.4	70.4	330
Bis(2-chloroethyl)ether	330	215.2	180.8	230.0	232.0	195.0	224.4	217.1	213.5	19.0	59.6	330
2-chlorophenol	330	234.3	194.0	256.7	257.7	206.9	251.8	227.4	232.7	25.0	78.7	330
1,3-Dichlorobenzene	330	198.7	163.7	211.5	214.8	176.6	215.5	203.9	197.8	20.2	63.5	330
1,4-Dichlorobenzene	330	204.9	182.8	228.4	227.7	178.2	229.7	216.8	209.8	21.8	68.6	330
1,2-Dichlorobenzene	330	205.9	172.9	226.4	223.1	182.8	226.1	203.3	205.8	21.4	67.3	330
2-methylphenol	330	223.1	184.8	235.0	231.7	187.4	222.1	206.6	212.9	20.4	64.2	330
Bis(2-chloroisopropyl)ether	330	231.7	198.7	258.1	250.8	216.2	167.0	145.2	209.6	42.1	132.5	330
4-Methylphenol	330	212.5	173.6	217.1	229.4	185.5	221.1	205.3	206.3	20.1	63.0	330
n-nitroso-di-n-propylamine	330	230.0	183.5	240.9	252.1	178.5	224.1	214.5	217.7	27.8	87.3	330
Hexachloroethane	330	158.7	143.2	162.0	167.3	139.9	182.8	172.9	161.0	15.4	48.4	330
Nitrobenzene	330	221.8	192.7	229.0	238.9	199.3	232.3	213.8	218.3	17.2	54.2	330
Isophorone	330	218.1	191.4	232.0	238.3	210.2	227.4	211.9	218.5	15.8	49.7	330
2-Nitrophenol	330	197.0	159.7	212.5	222.4	165.7	194.4	193.4	192.2	22.8	71.6	330
2,4-Dimethylphenol	330	163.0	136.0	158.1	157.7	141.9	179.5	152.5	155.5	14.3	44.8	330
Bis(2-chloroethoxy)methane	330	218.5	184.1	225.4	233.6	211.5	223.4	205.9	214.6	16.2	51.1	330
2,4-Dichlorophenol	330	225.7	189.8	240.6	245.2	196.7	233.6	215.8	221.1	21.4	67.2	330
1,2,4-Trichlorobenzene	330	199.7	181.2	214.5	222.1	194.7	224.4	206.9	206.2	15.6	48.9	330
Naphthalene	330	228.4	201.3	244.5	248.2	215.2	236.3	227.7	228.8	16.4	51.7	330
4-Chloroaniline	330	196.0	163.0	170.9	159.4	180.8	213.2	190.7	182.0	19.3	60.7	330
Hexachlorobutadiene	330	168.0	152.5	170.6	182.2	171.9	193.4	190.7	175.6	14.3	44.8	330
2-Chloro-3-methylphenol	330	236.3	208.6	240.9	242.2	190.1	240.9	222.4	225.9	20.1	63.1	330
2-methylnaphthalene	330	236.3	199.7	243.2	249.5	223.7	244.5	230.3	232.5	16.9	53.3	330
Hexachlorocyclopentadiene	330											330
2,4,6-Trichlorophenol	330	216.2	190.1	236.3	245.2	195.0	221.1	196.0	214.3	21.5	67.6	330
2,4,5-Trichlorophenol	330	236.3	207.2	251.1	249.5	203.6	246.8	231.0	232.2	19.7	61.9	330
2-Chloronaphthalene	330	221.8	193.7	235.0	247.2	215.2	231.3	215.8	222.8	17.2	54.0	330
2-Nitroaniline	330	188.4	159.7	188.8	212.5	132.0	193.4	170.9	178.0	26.3	82.7	825
Dimethylphthalate	330	234.3	228.7	254.8	258.7	235.6	247.5	232.3	241.7	11.9	37.3	330
Acenaphthylene	330	227.7	213.8	248.2	258.7	225.7	240.2	229.0	234.8	15.2	47.8	330
2,6-Dinitrotoluene	330	192.1	155.8	195.4	203.3	131.3	191.7	166.3	176.6	26.2	82.4	330
3-Nitroaniline	330	225.1	172.9	233.0	239.6	170.6	233.6	226.4	214.5	29.6	92.9	825
Acenaphthene	330	240.6	228.4	257.4	269.9	241.9	252.8	236.9	246.8	14.0	44.1	330
2,4-Dinitrophenol	330	48.5	86.5	46.9	62.7	97.0	96.4	85.8	74.8	21.7	68.3	825
4-Nitrophenol	330	232.0	182.2	240.9	219.8	134.6	233.0	203.3	206.5	37.6	118.1	330
Dibenzofuran	330	227.7	213.8	242.2	253.8	224.7	245.2	225.7	233.3	14.0	44.1	330
2,4-Dinitrotoluene	330	199.7	185.5	204.6	215.8	155.8	205.6	188.1	193.6	19.7	61.8	330
Diethylphthalate	330	241.6	236.3	257.4	259.4	238.3	245.5	232.3	244.4	10.4	32.8	330
4-Chlorophenyl-phenylether	330	225.7	210.5	231.7	242.9	218.5	246.2	225.1	228.6	12.7	40.0	330
Fluorene	330	235.0	213.2	244.9	254.1	231.0	248.8	232.3	237.0	13.7	43.0	330
4-Nitroaniline	330	211.9	161.7	208.6	180.2	147.2	190.7	189.8	184.3	23.5	74.0	825
4,6-Dinitro-2-methylphenol	330	157.4	97.7	153.5	169.0	88.1	160.4	162.4	141.2	33.4	105.1	825
n-Nitrosodiphenylamine	330	229.7	219.8	245.2	241.9	246.5	251.5	233.0	238.2	11.2	35.1	330
4-Bromophenyl-phenylether	330	236.3	208.6	240.2	255.4	258.7	257.4	230.3	241.0	18.2	57.1	330
Hexachlorobenzene	330	247.5	248.2	266.6	265.3	283.8	277.2	249.5	262.6	14.7	46.2	330
Pentachlorophenol	330	227.0	196.0	240.2	242.9	206.9	239.6	227.7	225.8	18.0	56.5	330
Phenanthrene	330	247.8	237.3	268.0	264.0	268.0	264.0	247.8	256.7	12.2	38.4	330
Anthracene	330	230.0	225.7	246.8	241.6	244.9	246.2	231.0	238.0	8.8	27.8	330
Carbazole	330	306.6	302.3	349.8	327.4	343.2	325.7	310.2	323.6	18.3	57.6	330
Di-n-butylphthalate	330	245.5	229.0	251.5	251.5	254.1	247.2	239.6	245.5	8.7	27.4	330
Fluoranthene	330	258.7	249.5	272.6	269.9	281.2	277.2	265.0	267.7	11.0	34.4	330
Pyrene	330	248.8	239.6	260.4	264.0	254.1	255.1	257.1	254.1	8.0	25.2	330

## WESTON-Gulf Coast, Inc.

GC/MS Semivolatile CLP OLM01.8 MDL Study: Instrument 04

Extraction Method: 3520 - Soil Matrix (Calculated from the Water MDL's)

Analysis Date: 02/04/94

Compound	Std.Conc. (ug/kg)								Average	Std.Dev.	Report	
		MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7			MDL	Limit
Butylbenzylphthalate	330	235.6	219.1	228.0	234.3	227.7	228.7	221.1	227.8	6.1	19.2	330
3,3-Dichlorobenzidine	330	188.8	176.9	157.7	147.2	186.8	207.9	222.1	183.9	26.3	82.6	330
Benzo(a)anthracene	330	269.0	245.2	265.7	270.3	264.7	268.3	261.0	263.4	8.6	27.1	330
Chrysene	330	279.2	268.0	296.0	289.1	290.4	284.1	278.5	283.6	9.3	29.3	330
Bis(2-ethylhexyl)phthalate	330	244.9	222.4	244.2	246.5	241.6	240.6	234.3	239.2	8.4	26.4	330
Di-n-octylphthalate	330	248.8	215.2	240.9	240.9	231.7	246.8	227.7	236.0	11.9	37.5	330
Benzo(b)fluoranthene	330	298.0	284.1	310.9	339.9	308.2	330.0	296.0	309.6	19.6	61.6	330
Benzo(k)fluoranthene	330	299.0	254.8	293.7	285.8	298.3	284.8	294.4	287.2	15.4	48.3	330
Benzo(a)pyrene	330	275.2	237.6	276.2	295.4	277.5	285.1	278.5	275.1	18.0	56.5	330
Indeno(1,2,3-CD)Pyrene	330	264.7	242.2	264.0	265.0	258.7	271.3	268.0	262.0	9.5	29.9	330
Dibenzo(a,h)anthracene	330	261.4	221.1	238.9	264.7	237.6	263.3	265.3	250.3	17.6	55.5	330
Benzo(g,h,i)perylene	330	275.9	251.8	281.2	293.0	286.1	292.4	295.7	282.3	15.2	47.7	330

WESTON-Gulf Coast, Inc.  
 IC1: ICAP 1100 - 1994 MDL

Method: SW846-3050A  
 (1.0 g/100 mL)

RFW #: 9401G715 (001-007)

Digestion Batch: 94GI009 All Metals except Fe and Si  
 94GI069 Fe Only  
 94GI177 Si Only

Analysis		Report	Known											MDL	MDL	Report
Date	El	Limit	ug/L	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev		ug/L	mg/kg	Limit
02/02/94	Al	200	1000	918.8	926.5	899.8	949.6	930.8	925.5	926.7	925.4	14.81		46.5	4.7	20
02/02/94	Sb	100	500	442.1	450.2	435.0	454.4	439.8	455.8	456.8	447.7	8.70		27.3	2.7	10
02/02/94	Ba	50	250	245.1	244.5	240.1	251.1	245.5	244.6	245.4	245.2	3.21		10.1	1.0	5
02/02/94	Be	5	25	24.3	24.2	24.2	25.3	24.4	24.5	24.4	24.5	.38		1.2	.1	.5
02/02/94	B	50	250	253.8	254.9	248.8	255.8	247.8	244.7	256.8	251.8	4.66		14.7	1.5	5
02/02/94	Cd	10	50	45.0	45.8	43.9	44.8	43.4	45.9	45.8	44.9	.98		3.1	.3	1
02/02/94	Ca	100	500	526.6	543.0	529.2	553.9	540.8	546.7	553.8	542.0	10.85		34.1	3.4	10
02/02/94	Cr	20	100	100.8	103.6	100.5	104.2	104.1	105.5	103.8	103.2	1.85		5.8	.6	2
02/02/94	Co	20	100	96.0	96.4	96.3	99.9	96.9	96.4	97.4	97.0	1.33		4.2	.4	2
02/02/94	Cu	20	100	94.1	91.5	90.9	95.8	93.7	93.3	94.3	93.3	1.67		5.3	.5	2
02/11/94	Fe	30	150	158.8	159.2	163.4	166.0	156.0	159.1	158.2	160.1	3.42		10.7	1.1	3
02/02/94	Pb	50	250	229.7	231.4	231.7	247.0	242.6	246.6	248.2	239.6	8.31		26.1	2.6	5
02/02/94	Mg	200	1000	941.0	948.8	929.1	971.7	945.4	950.6	966.0	950.4	14.54		45.7	4.6	20
02/02/94	Mn	10	50	48.5	49.0	48.2	50.0	48.7	48.6	49.0	48.9	.59		1.8	.2	1
02/02/94	Mo	100	500	475.9	479.4	472.7	494.3	479.7	478.4	480.6	480.1	6.78		21.3	2.1	10
02/02/94	Ni	20	100	99.8	98.6	97.3	105.1	99.4	98.3	101.8	100.0	2.62		8.2	.8	2
02/02/94	K	2000	10000	9134.3	9136.5	9058.3	9435.9	9247.7	9188.7	9224.4	9203.7	120.40		378.4	37.8	200
02/02/94	Ag	30	150	134.6	136.2	133.3	140.4	138.8	137.4	137.6	136.9	2.43		7.6	.8	3
02/02/94	Na	200	1000	1014.0	1006.4	987.0	1001.7	1006.9	994.8	1018.0	1004.1	10.71		33.7	3.4	20
02/02/94	Sr	100	500	489.2	488.6	480.3	501.7	490.1	489.3	490.5	489.9	6.25		19.7	2.0	10
02/02/94	Tl	500	2500	2247.5	2224.3	2150.2	2262.5	2162.7	2189.3	2221.1	2208.2	42.25		132.8	13.3	50
02/02/94	Sn	100	500	462.6	462.8	469.0	489.9	477.6	490.3	487.0	477.0	12.33		38.8	3.9	10
02/02/94	V	10	50	49.0	49.0	47.9	50.1	48.8	48.5	49.1	48.9	.66		2.1	.2	1
02/02/94	Zn	10	50	44.0	47.5	47.4	50.4	48.2	46.3	48.0	47.4	1.96		6.1	.6	1
03/23/94	Si	200	500	857.8	752.6	675.7	749.3	731.4	815.9	705.9	755.5	62.68		197.0	19.7	20
02/02/94	Ti	10	50	47.9	49.5	47.0	52.0	49.8	48.7	49.7	49.2	1.59		5.0	.5	1
02/02/94	As	100	500	465.6	450.0	445.1	487.5	466.5	459.9	450.8	460.8	14.35		45.1	4.5	10
02/02/94	Se	100	500	449.2	454.9	477.8	489.9	461.4	467.8	445.6	463.8	15.93		50.1	5.0	10

WESTON-Gulf Coast, Inc.

IC2: ICAP 61 - 1994 MDL

Method: SW846-3050A

(1.0 g/100 mL)

RFW #: 9401G719 (001-007)

Digestion Batch: 94GI009 All Metals except Fe and Si

94GI069 Fe Only

94GI177 Si Only

Analysis		Report	Known											MDL	MDL	Report
Date	El	Limit	ug/L	MDL 1	MDL 2	MDL 3	MDL 4	MDL 5	MDL 6	MDL 7	Average	Std.Dev		ug/L	mg/kg	Limit
02/03/94	Al	200	1000	990.9	964.1	963.4	986.2	975.4	970.0	1020.6	981.5	20.16		63.4	6.3	20
02/03/94	Sb	100	500	470.6	460.6	454.0	478.0	461.4	472.4	463.9	465.9	8.22		25.8	2.6	10
02/03/94	Ba	50	250	246.0	243.7	240.8	250.1	245.7	243.7	246.8	245.3	2.91		9.1	.9	5
02/03/94	Be	5	25	25.4	24.9	24.3	25.1	24.8	25.0	24.9	24.9	.33		1.0	.1	.5
02/03/94	B	50	250	254.0	263.2	252.1	248.9	248.3	241.6	250.9	251.3	6.54		20.6	2.1	5
02/03/94	Cd	10	50	44.4	44.6	44.7	45.2	45.2	45.8	44.7	45.0	.49		1.5	.2	1
02/03/94	Ca	100	500	554.0	546.9	543.4	554.7	549.9	558.3	568.7	553.7	8.30		26.1	2.6	10
02/03/94	Cr	20	100	105.0	100.7	101.5	104.7	101.9	103.6	103.6	103.0	1.66		5.2	.5	2
02/03/94	Co	20	100	99.0	95.6	96.4	99.0	97.1	98.2	96.9	97.4	1.30		4.1	.4	2
02/03/94	Cu	20	100	96.1	94.6	94.5	97.4	95.1	95.8	96.0	95.7	1.00		3.2	.3	2
02/14/94	Fe	30	150	149.5	165.3	157.7	149.2	143.6	145.7	144.9	150.8	7.92		24.9	2.5	3
02/03/94	Pb	50	250	235.7	246.7	254.3	243.3	244.9	245.1	243.1	244.7	5.51		17.3	1.7	5
02/03/94	Mg	200	1000	955.3	941.5	960.1	997.3	962.2	978.6	969.7	966.4	17.86		56.1	5.6	20
02/03/94	Mn	10	50	50.9	49.1	48.6	50.7	49.7	49.4	49.9	49.8	.83		2.6	.3	1
02/03/94	Mo	100	500	482.1	479.4	470.9	490.3	477.3	478.6	484.1	480.4	6.02		18.9	1.9	10
02/03/94	Ni	20	100	95.3	98.8	96.6	102.1	93.8	98.6	99.6	97.8	2.79		8.8	.9	2
02/03/94	K	2000	10000	9948.5	9190.9	9276.8	9741.4	9767.4	9655.6	9843.2	9632.0	287.63		904.0	90.4	200
02/03/94	Ag	30	150	140.9	139.6	138.4	145.2	141.5	143.3	143.9	141.8	2.43		7.6	.8	3
02/03/94	Na	200	1000	975.9	981.6	983.1	999.8	996.1	987.1	1013.1	991.0	12.82		40.3	4.0	20
02/03/94	Sr	100	500	487.0	483.2	479.6	494.8	484.7	487.3	488.5	486.4	4.74		14.9	1.5	10
02/03/94	Tl	500	2500	2327.1	2300.0	2307.1	2397.2	2339.7	2323.1	2372.3	2338.1	35.17		110.6	11.1	50
02/03/94	Sn	100	500	485.3	495.9	491.3	515.0	491.0	495.3	502.3	496.6	9.65		30.3	3.0	10
02/03/94	V	10	50	51.8	49.3	48.1	51.4	48.6	50.5	50.9	50.1	1.43		4.5	.5	1
02/03/94	Zn	10	50	53.6	50.1	49.0	53.9	50.6	50.3	51.0	51.2	1.81		5.7	.6	1
03/21/94	Si	200	500	853.3	752.4	666.7	757.0	724.7	814.0	704.7	753.3	63.74		200.3	20.0	20
02/03/94	Ti	10	50	50.0	49.3	48.8	50.2	49.4	49.6	49.4	49.5	.46		1.4	.1	1
02/03/94	As	100	500	491.9	484.4	460.7	490.3	454.9	483.3	477.0	477.5	14.38		45.2	4.5	10
02/03/94	Se	100	500	480.2	468.5	455.0	480.6	446.8	468.7	470.1	467.1	12.43		39.1	3.9	10
02/03/94	Li	100	50	459.9	458.4	456.1	475.4	465.3	463.6	464.8	463.3	6.35		20.0	2.0	10



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

**FILE COPY**

REPLY TO THE ATTENTION OF:

**SQ-14J**

**MEMORANDUM**

**DATE:** MAY 27 1994

**SUBJECT:** **Conditional Approval** of the Second Revision, Quality Assurance Project Plan (QAPP) for RCRA Facility Investigation (RFI) for the Techalloy Company, Inc., Union, Illinois

*Willie H. Harris*  
**FROM:** Willie H. Harris  
Regional Quality Assurance Manager

**TO:** Joseph Boyle, Chief  
RCRA Enforcement Branch

**ATTENTION:** William Buller, RCRA Project Coordinator

I am providing a **conditional approval** of the subject QAPP. The Quality Assurance Section (QAS) received the subject QAPP on April 28, 1994, (QAS Log-in No. R177).

The conditions for approval are: 1) correct the QAPP as stated below, and 2) the performance of a laboratory audit.

Correct the following tables:

1. Revise Tables 2-12.1 through 2-12.3 to included the IEPA's clean-up levels.
2. Revise Table 2-14 (Data Quality Objectives) to include the newly added analyses, SVOCs in soil; and ammonia, chloride, nitrate, and sulfate in groundwater.

The Contract Analytical Support Section (CASS) recommends that the laboratory, WESTON-Gulf Coast Laboratories, be audited for the following reasons:

1. The laboratory has not been audited in over two years and the analytical as well as quality assurance procedures may have changed during this time.
2. Written analytical and custody procedures, as provided in the QAPP, are appropriate. An on-site audit would confirm that they are being followed.

3. The IEPA's clean-up objective concentration levels are slightly lower than the laboratory's reporting limits, it is necessary to examine the laboratory's method detection limit (MDL) data for the analytical protocol being used for this project. The laboratory's MDLs are probably lower than their reporting limits.
4. An on-site audit is recommended to confirm that the laboratory has all of the necessary equipment.

An audit request form must be submitted to Dennis Wesolowski, Chief of the CASS of MQAB. If there are any questions regarding this memorandum, the Project Coordinator can contact Denise Boone of my staff.

I have signed the attached signature page. Please have the Project Coordinator provide final sign-off. We would like to receive a copy of the completed signature page within the next two weeks.


Attachment

cc: Michael DeRosa, HRE-8J

**FINAL QUALITY ASSURANCE PROJECT PLAN  
FOR THE  
RCRA FACILITY INVESTIGATION  
TECHALLOY COMPANY, INC.  
UNION, ILLINOIS**

March 1994

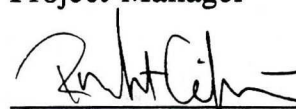
Prepared  
and  
Approved by:

  
Carlos J. Serna, P.G., WESTON  
Project Manager

Date:

3/23/94

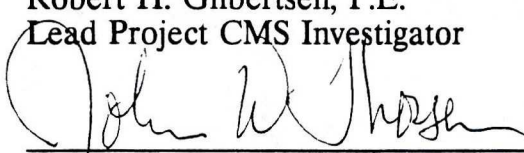
Approved by:

  
Robert H. Gilbertsen, P.E.  
Lead Project CMS Investigator

Date:

23 MARCH 94

Approved by:

  
John W. Thorsen, P.E., WESTON  
Project Director

Date:


28 March 1994

Approved by:

Raymond J. Frederici  
Laboratory Quality Assurance Manager

Date:

Approved by:

  
Henry Lopes, Techalloy Company, Inc.  
Vice President

Date:


3/28/94

Approved by:

William Buller, U.S. EPA  
RCRA Project Coordinator

Date:

Approved by:

  
Willie Harris, U.S. EPA  
Regional Quality Assurance Manager

Date:


5/27/94

Approved by:

  
Charles Elly, U.S. EPA Region V  
Director, Central Regional Laboratory

Date:

Approved by:

  
Robert C. Brod  
Quality Assurance Manager

Date:

3/23/94

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V

FILE COPY

DATE: 5-20-94

SUBJECT: Review of Techalloy RFI Draft QAPjP for Lab Audit Purposes

FROM: Patrick J. Churilla, Chemist, CASS

*Patrick J. Churilla*

THROUGH: Dennis Wesolowski, Chief, CASS

*DW*

TO: George Schupp, Chief, QAS

After reviewing the subject QAPP I recommend that the laboratory, WESTON- Gulf Coast Laboratories, be audited for the following reasons:

1. The lab has not been audited by us in over two years and analytical as well as quality assurance procedures may have changed during this time.
2. Written analytical and custody procedures, as provided in the QAPP, are appropriate. An onsite audit would confirm that they are being followed.
3. Since the QAPP clean-up objective concentration levels are slightly lower than the laboratory's reporting limits, it is necessary to examine the lab's method detection limit data for the analytical protocol being used for this project. The lab's MDLs are probably lower than their reporting limits.
4. An onsite audit is recommended to confirm that the laboratory has all of the necessary equipment.

If the Project Manager determines that an audit is necessary a laboratory audit request form needs to be submitted to Dennis Wesolowski, Chief of the Contract Analytical Services Section of MQAB.

RECEIVED  
MAY 20 1994

QUALITY ASSURANCE SECTION  
ENVIRONMENTAL SCIENCES DIV.



State of Illinois

# ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217/524-3300

May 17, 1994

Mr. Bill Buller  
United States Environmental Protection Agency  
Region V  
RCRA Enforcement Branch, (HRE-8J)  
77 West Jackson Boulevard  
Chicago, IL 60604

**RECEIVED**  
MAY 19 1994

**OFFICE OF RCRA**  
**WASTE MANAGEMENT DIVISION**  
**EPA, REGION V**

RE: 1110900003 -- McHenry County  
Techalloy, Inc./Union  
ILD005178975  
RCRA Closure

Dear Mr. Buller:

The Illinois Environmental Protection Agency (IEPA) would like to provide the following comments on the RCRA Facility Investigation Workplan and Quality Assurance Project Plan (QAAP). Revisions to the workplan were required by USEPA's February 8, 1994 letter. The revisions, dated March 23, 1994 and received by the IEPA on April 6, 1994, were submitted by Roy F. Weston, Inc. on behalf of Techalloy (TA).

1. Tables 2-8, and 2-9 of the QAAP, page 2-34 and 2-39: The tables refer to on-site (Class II) and off-site (Class I) objectives based upon 35 IAC Part 620 standards. The 35 IAC Part 620 standards were established after the initial cleanup standards were established in 1990. The current standards based Part 620 do not allow for Class II standards to be used on-site and Class I standards off-site. The Class I and II standards established under Part 620 are different from the Class I and II standards previously established by the IEPA. The only groundwater standard that currently applies to this site are the Class I standards.
2. Tables 2-12.1 through 2-12.3 of the QAAP, pages 2-42.1 through 2-42.3, refer to "action levels" which were apparently agreed to at a March 23, 1993 pre-QAPP meeting. How is the term "action levels" defined and what are the values?

3. Page 2-44.1 of the QAAP: The statement that the primary constituents transported through groundwater are VOCs is not appropriate at this time. The inorganic salts (i.e., ammonia, chlorides, sulfate, sodium and potassium) have not been fully investigated.
4. Page 2-45 of the QAAP: The last paragraph of the page indicates that the community water supply wells that are not presently being used are not potential receptors. If the wells have not been properly abandoned (sealed), the wells are potential receptors. There are no restrictions to the future use of these wells if they have not been sealed.
5. Page 2-46 of the QAAP: The statement that the constituents found at Union's Municipal Well #3 are not representative of Techalloy's plume constituents (i.e., VOCs) is not appropriate at this time. The inorganic salts (i.e., ammonia, chlorides, sulfate, sodium and potassium) have not been fully investigated.
6. USEPA's comment on Section 2.0 of the Workplan, page 2-47, indicates that the sentence pertaining to Southern California Chemical (SCC) should be deleted. Page 2-46 of the QAAP contains a reference SCC that is identical to the one that was removed from page 2-47 of the Workplan. The references to Southern California Chemical as the major contributor to the inorganic contamination evidenced at Union's Municipal Well #3 should be deleted unless it can be substantiated with documentation or references.
7. Page 2-48.1 of the QAAP, last paragraph, states, "the groundwater pathway will also be assessed at each SWMU location for the presence of VOCs, metals, other inorganics, and total suspended solids." Page 2-49 states that the background groundwater sampling locations will not be tested for other inorganic parameters as identified in Table 12.3. To properly assess the impact that the site has had on the groundwater all of the background sampling wells should also be analyzed for the "other inorganic parameters."
8. Page 2-47 of the Workplan: The statement that the plume emanating from Techalloy consists primarily of VOCs is not appropriate at this time. The inorganics (i.e., ammonia, chlorides, sulfate, sodium and potassium) identified at Union's Municipal Well #3 have not been adequately characterized in and around Techalloy's facility.
9. In response to USEPA's comments on Section 3.1b of the Field Sampling Plan (FSP), regarding the use of sampling procedures to minimize the exposure of soil samples to air, TA indicates that no suggestions are given to do this and that the samples will be taken from the split-spoon sampler as the spoon is open. The IEPA has developed a procedure for the collection of VOC soil samples to minimize the exposure to air and subsequent loss of VOCs from soil samples. See Attachment 1.


Techalloy RFI Work Plan and QAPP Comments  
page 3

Should you have any questions regarding this matter, please contact Kevin D. Lesko at 217/524-3271.

Sincerely,



Douglas W. Clay, P.E.  
Hazardous Waste Branch Manager  
Permit Section, Bureau of Land

  
DWC:KL:\ta\3008(h)\rfi-6-94.use

Attachment: Soil Volatile Sampling Procedure

## Soil Volatile Sampling Procedures

A. PREPARATION AND DECONTAMINATION OF SOIL SAMPLER (i.e. STAINLESS STEEL, BRASS, BRONZE, COPPER, etc.). An example of these samplers would be a shelby tube, split-barrel sampler with metal tube inserts or california sampler. These are only examples. There may be more types available. Also, the sample tube **must** be at least six inches long.

- \* 1. Wash tubing or sampler with hot water and a nonfoaming detergent.
- 2. Rinse with hot water.
- \* 3. Rinse with a solvent, such as hexane or acetone.
- 4. Rinse with very hot water to drive off solvent.
- 5. Rinse with deionized distilled water.
- 6. Air Dry
- 7. Store the sampler in aluminum foil until ready for use.

\* Consult the laboratory for specific recommendations.

### B. SOIL SAMPLING FOR VOLATILE ORGANICS

1. Using a properly decontaminated sampler (refer to preparation and decontamination instructions), push or drive the sampler to obtain a representative soil sample.
2. **DO NOT** remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tube.
3. Immediately add clay or other cohesive material (i.e. wetted bentonite) to the ends of the sample to eliminate head space, if necessary.
4. Cover both ends of the sampler with aluminum foil. If possible, cover the aluminum foil with a cap.
5. Put the sample in storage at 4 degrees centigrade immediately.
6. Transport the samples to the laboratory as soon as possible. Most laboratories require delivery within 24 hours of sampling.

**NOTE:** Soil samples which will be tested for volatile organic constituents cannot be composited because of the volatilization which would result from any compositing method.

*Boyle* Pls send this  
over to Willie.  
Thanks.

*4/4/94*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V

DATE:

SUBJECT: Request for Evaluation of Quality Assurance Project Plan (*Revised*)

FROM: *Kevin M. Picard*, Chief  
RCRA Enforcement (Permits) Branch

TO: ~~Valerie Jones~~, Chief *WILLIE HARRIS*  
Regional Quality Assurance Manager

A Quality Assurance Project Plan (QAPP) has been received for sampling and analysis to be done under a RCRA Facility Investigation (RFI) (or Corrective Measures Study, (CMS)). A Pre-QAPP meeting was held on June 7 1993 regarding this facility. Please review this QAPP with particular attention to the technical aspects, including appropriate parameters, methods, and detection limits. The technical contact named below can discuss any facility specific issues which characterize this facility. Please complete this review within thirty (30) calendar days from receipt, with a goal of twenty-one (21) days, if possible.

Facility Name: Techallog, Inc State: Texas

RCRA Project Coordinator: Bill Butler Phone: 6-4568

Section Chief: *[Signature]*

RECEIVED  
APR 12 1994  
QUALITY ASSURANCE SECTION  
ENVIRONMENTAL SCIENCES DIV.  
OAS LOGIN NUMBER *R177*  
DATE *5-28-94*  
SIGNED TO *Boyle D.*

RECEIVED  
APR 05 1994  
MONITORING & QUALITY  
ASSURANCE BRANCH  
ENVIRONMENTAL SCIENCES DIV.

Attachments

cc: Chuck Elly, Director, CRL (w/attachments)

Note: See page 7 of  
Memorandum of Agreement -  
Item 2

RECEIVED  
MAR 30 1994

CENTRAL  
DISTRICT OFFICE

*to the reviewer*  
*Where is the QAPP?*



Roy F. Weston, Inc.  
Suite 400  
3 Hawthorn Parkway  
Vernon Hills, Illinois 60061-1450  
708-918-4000 • Fax 708-918-4055



Mr. Joseph M. Boyle, Chief  
RCRA Enforcement Branch  
United States Environmental Protection Agency  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

Work Order No. 01989-009-001-0040

Re: Response to Comments for the Draft RFI Work Plan and QAPP for Techalloy Company, Inc. Located in Union, Illinois

Dear Mr. Boyle:

Enclosed are the corrected pages to the RFI work plan and QAPP. The comments indicated in your letter dated 8 February 1994 have been addressed as requested. Only the pages where changes occurred are contained in this packet. These pages are identified by Revision: 1 (work plan) and Revision: 2 (QAPP) in the header with a corresponding date of 24 March 1994. Please insert these pages into your copies.

It is Techalloy Company's desire to begin the investigation so that it can responsibly address environmental concerns around the facility. Performing the field work during this summer will contribute to the speed and quality of the project.

The remainder of this letter provides a summary of the comments made by the U.S. EPA and the responses. The numbers in parentheses refer to the reviewer's outline structure.

#### **WORK PLAN COMMENTS**

**COMMENT:** Section 1.0, PURPOSE, This paragraph should also quote or reference Section VI.C and the purpose statement of Attachment I of the AOC.

**RESPONSE:** Section 1 of the work plan is modified to include references to Section VI.C and the purpose statement of Attachment 1 of the AOC.

**COMMENT:** Section 2.0, page 2-47, - Delete sentence pertaining to Southern California Chemical.

**RESPONSE:** The sentence has been modified to reflect a generic "chemical company."



Mr. Joseph M. Boyle  
U.S. EPA

-2-

23 March 1994

**COMMENT:** Section 2.5.1. - This section refers to metals and inorganic analyses of soil sample SB-05. These results could not be identified and should be provided. The statement "concentrations of inorganics are of little concern" should be justified or deleted.

**RESPONSE:** The location of SB-05 is shown on Figure 2-5 and the inorganic data associated with this sampling location is summarized on Table 2-1. The statement, "concentrations of other inorganics are of little concern" is deleted and replaced with a sentence reflecting the detection of arsenic, barium, cadmium, and sulfate at this sampling location.

**COMMENT:** 2.5.3 - This section notes the inorganic constituents in a Union well 3 sample and the volatile organic compounds (VOCs) in the plume emanating from the Techalloy facility, and states that "these constituents are inconsistent." Inorganic analytical groundwater data has not been provided to support this statement.

**RESPONSE:** The statement is modified to state that the MW-3 well reportedly contains primarily inorganic constituents while the plume emanating from the Techalloy facility consists primarily of VOCs.

**COMMENT:** Section 5.2.1. - Soil samples shall also be analyzed for semi-volatile organic compounds (SVOCs), or provide rationale for not analyzing for these compounds.

**RESPONSE:** Historical information regarding the processes and materials used at the Techalloy facility and the results of previous investigations indicate VOCs, metals, and possibly cyanide as the primary analytes of concern. SVOCs have apparently not been used during the manufacturing process and have been analyzed for on occasion in the past with no apparent detections. As discussed in the pre-QAPP meeting of 31 March 1993, Techalloy agreed to sample SVOCs for selected groundwater locations. Groundwater has been identified as the primary contaminant migration pathway. SVOCs have been analyzed previously in groundwater in the center of the plume (MW-07) and were not detected. Based on recent conversations with U.S. EPA, limited SVOCs will be analyzed in soil samples collected in the BG-5 Oil Drum Storage Area and Concrete Evaporation Pad to gather information that will be applicable for future remedial planning. Additionally, SVOC samples will be collected for upgradient soils to determine the background concentration of SVOCs in soils.

**COMMENT:** 5.2.4. The RFI should identify all actual and potential receptors.

Mr. Joseph M. Boyle  
U.S. EPA

-3-

23 March 1994

**RESPONSE:** The names and addresses of the twelve residential wells identified and sampled as discussed in the "Private Well Sampling Plan, February 1993," are summarized on Table 5-2A.

**COMMENT:** Section 5.2.1. (Table 5-3) Based upon the past usage of the spent acid holding pond, analyses should include nitrate, chloride, sulfate, calcium, sodium, potassium, and ammonium.

**RESPONSE:** Table 5-3 is modified to include the analysis of the following inorganic parameters ammonium, chloride, nitrate, and sulfate - for soil samples collected from the spent acid holding pond. Additionally, the metals analysis will include calcium, sodium and potassium.

**COMMENT:** Monitoring wells MW-7 and MW-5 should also be analyzed for these constituents. Table 5-3 should specify the specific metal analyses to be performed.

**RESPONSE:** Table 5-3 is modified to include the analysis of inorganic parameters as stated in comment 7 for MW-7 and MW-5. Specific metals included in the metals analysis are contained in Table 8-2 of the QAPP.

**COMMENT:** A representative groundwater sample shall be collected near the probe sample SW-21 of Figure 3-4 and analyzed for VOCs.

**RESPONSE:** The RFI work plan is modified to include the collection of a representative groundwater sample near the existing probe location SW-21. This sample will be collected using a Geoprobe and analyzed for VOCs to verify the downgradient extent of contamination.

**COMMENT:** Provide cross-sections (transverse to plume mainly) showing water levels, contaminant concentrations, lithology, and depth intervals of probe and auger samples. If this data does not assure representative samples of the contaminant plume were collected, additional groundwater samples should be proposed at appropriate depth intervals and locations.

**RESPONSE:** Cross sections parallel and transverse to the groundwater plume have been constructed and included in the RFI work plan. These cross sections contain the requested information in the comment. The data indicates that the plume has been adequately delineated and no further groundwater samples are proposed.

Mr. Joseph M. Boyle  
U.S. EPA

-4-

23 March 1994

**COMMENT:** Provide an illustration similar to figure 3-4 which delineates plume based on total VOC concentrations.

**RESPONSE:** An illustration similar to Figure 2-10 has been constructed and is included in the RFI work plan. It does not appear that the configuration of the plume is significantly changed from that depicted in existing Figure 2-10.

**COMMENT:** Revise figure 5-3 to show time frames in weeks without specific dates. Time frame to submit draft RFI report after U.S. EPA approval of RFI work plan shall be specified to be 360 days. Revise Section 5.5 accordingly.

**RESPONSE:** Figure 5-3 has been revised to show a 400 day time frame from U.S. EPA approval of the RFI work plan until submission of the draft RFI report.

**COMMENT:** Rather than implementing RFI Phase II under a separate Work Plan, Phase II shall be implemented after Phase I results have been evaluated. Phase II shall include any additional data collection to fill any data gaps as identified by Phase I results. The Phase II results shall be included in the RFI draft report.

**RESPONSE:** The RFI schedule has been revised as requested. Techalloy will present an outline of Phase II activities to the U.S. EPA upon completion of the Phase I Technical Memorandum at a meeting at agency headquarters. It is assumed that an agreement or any modifications to the Phase II activities will be approved at this meeting. No agency review time is assumed in the schedule. Phase II mobilization will begin following the meeting. The schedule also assumes no off-site Phase II activities will be conducted which may require access agreements. Phase II will be limited to identifying and resolving data gaps in the Phase I investigation. If the agency requires a review period and/or off-site access is required, the schedule will no longer be appropriate and will need to be revised to indicate changes.

**COMMENT:** Ecological Assessment - Identify and describe the habitat possibly affected by contaminants from the facility. Specify if there are any old-field or edge habitats and if the holding pond has been utilized by birds.

Describe methods for a qualitative assessment (e.g. reconnaissance survey) of plants and animals at or near the facility. Include a written confirmation from the U.S. Fish and Wildlife Service, Chicago Metro Field Office, that the following federally listed or proposed threatened or endangered species are not present at or near the facility: Bald Eagle; Indiana Bat; and prairie Bush Clover. The assessment should identify any known or observed adverse effects (stressed vegetation, bird carcasses, or other obvious impacts) by

Mr. Joseph M. Boyle  
U.S. EPA

-5-

23 March 1994

site contaminants to biota. State whether or not any adverse effects have been noted by employees or other observers.

Describe methods to evaluate potential impacts of contaminants on plants and animals. These methods should include analysis of available data, fate and transport analysis, toxicity criteria, and standards for all contaminants of concern.

**RESPONSE:** The RFI work plan has been modified to include an ecological assessment task (described in new Subsection 5.2.4.1). This assessment will utilize data from site investigation, open literature, and relevant benchmark values to qualitatively determine whether it can be safely assumed that site chemicals pose no threat to ecological receptors.

**COMMENT:** Section 7.2.3 - Delete, specifies U.S. EPA responsibilities not stated in the AOC.

**RESPONSE:** Section 7.2.3 is deleted from the RFI work plan.

**QAPP COMMENTS**

✓ **COMMENT:** Change the name of the Regional QA Manager. (1.0.a.)

**RESPONSE:** The new name now appears on the signoff page in the QAPP.

✓ **COMMENT:** Add the name of the laboratory QA Manager. (1.0.b.)

**RESPONSE:** The laboratory QA Manager's name now appears on the signoff page in the QAPP.

✓ **COMMENT:** Provide the project objectives. (2.1.1.)

**RESPONSE:** The project objectives, already available in the Work Plan, now appear in the QAPP as well, at page 2-1.

✓ **COMMENT:** Provide the project status and phase. (2.1.2.)

**RESPONSE:** The project status and phase, already available in the Work Plan, now appear in the QAPP as well, at page 2-1.

✓ **COMMENT:** Identify analytical methods and detection limits for past data. (2.2.1.a.)

Mr. Joseph M. Boyle  
U.S. EPA

-6-

23 March 1994

**RESPONSE:** The QAPP's tables now identifies all analytical methods and detection limits in every table referencing historical data.

✓ **COMMENT:** Specify sampling techniques for past data. (2.2.1.b.)

**RESPONSE:** The tables now contain brief descriptions of the sampling techniques.

✓ **COMMENT:** Summarize the past results. (2.2.1.c.)

**RESPONSE:** Section 2 of the QAPP summarizes the past results. No global change is required.

✓ **COMMENT:** Explain why dissolved metals were used. (2.2.1.d.)

**RESPONSE:** The QAPP, at page 2-28, now explains that dissolved metals were used to aid the reproducibility of the results.

✓ **COMMENT:** Explain the limitations and capabilities of headspace sampling. (2.2.1.e.)

**RESPONSE:** The QAPP, at page 2-31, now explains the limitations and capabilities of headspace sampling.

✓ **COMMENT:** Define what an on-site or off-site objective is. (2.2.1.f.)

**RESPONSE:** Table 2-8 of the QAPP now provides citations to the Illinois Administrative Code.

✓ **COMMENT:** Explain the basis for the past use of TCLP analyses. (2.2.1.g.)

**RESPONSE:** The QAPP, at page 2-40, now explains that TCLP analyses provided disposal information.

✓ **COMMENT:** Identify the locations of TT3 and TT4. (2.2.1.h.)

**RESPONSE:** Figure 2-11 of the QAPP now displays the locations of TT3 and TT4.

**COMMENT:** Describe the current status of the drums in the BG-5 drum storage area. (2.2.1.i.I.)

Mr. Joseph M. Boyle  
U.S. EPA

-7-

23 March 1994

**RESPONSE:** The QAPP, at page 2-40.1, now provides an update of the area's contents. Because Techalloy is an active facility operating under RCRA's generator regulations, the individual drums discussed in Revision 1 of the QAPP are no longer present, having been shipped to RCRA TSDs. The area today contains a different set of drums. The status of drums in storage continues to change from day to day. The QAPP's description is now accurate as of March 1994. It is hoped that future changes to the inventory will not require revisions to the QAPP.

✓ **COMMENT:** Describe previous analyses in the drum storage area. (2.2.1.i.II.)

**RESPONSE:** No previous analyses were performed. According to the MSDS for BG-5, the material contains aliphatic petroleum hydrocarbons. After contact with stainless steel, the waste BG-5 probably contains metals such as iron.

✓ **COMMENT:** Describe the project's current status. (2.2.3.a. -- gap in the outline exists in original outline)

**RESPONSE:** The QAPP now contains a supplemental description of the project's status at Page 2-1.

✓ **COMMENT:** Provide a geological model. (2.3.3.b.)

**RESPONSE:** The QAPP text, at page 2-15, provides a cross-reference to the work plan's geological model, which appears at Figure 2-10a of the Work Plan.

✓ **COMMENT:** Resolve the conflict arising from knowing the constituents' distribution while not knowing their precise distribution. (2.3.3.c.)

**RESPONSE:** The QAPP text, at page 2-38, now explains that although the *general* distribution is known, the *precise* distribution is unknown.

✓ **COMMENT:** Explain the absence of organic analyses in the previous SWMUs. (2.3.3.d.)

**RESPONSE:** The previous SWMUs consisted of inorganic reaction vessels. The chemicals employed in those vessels are well understood, and the chemicals are not organics. Based on that knowledge, organic analyses were not necessary

✓ **COMMENT:** Provide confirmatory samples. (2.3.3.e.I.)

Mr. Joseph M. Boyle  
U.S. EPA

-8-

23 March 1994

**RESPONSE:** The QAPP, at page 2-40.1 et seq., now clearly states that borings will be installed in and around each SWMU. The text provides a cross reference to Sections 2 and 3 of the FSP. The FSP identifies the sample locations, the analyses to be performed, and sampling procedures and protocols.

✓ **COMMENT:** Identify the sampling technique for migration pathways. (2.3.3.e.II.)

**RESPONSE:** The QAPP, at page 2-40.1 et seq., now describes the round of sampling to be conducted in all 13 existing nearby wells. The QAPP assures that filtered and unfiltered samples will receive analysis for metals.

**COMMENT:** Identify the number of samples, their locations, and their methods. (2.3.3.e.III.)

✓ **RESPONSE:** The QAPP, at page 2-40.1 et seq., now provides some additional information. The FSP provides any remaining information. The QAPP text provides a cross reference to the FSP.

✓ **COMMENT:** Explain how groundwater metal samples were withdrawn and what analyses were performed for metals. (2.3.3.e.IV.)

**RESPONSE:** It is true that bailers and filtered samples were used. No change is needed in the QAPP.

✓ **COMMENT:** Provide additional documentation or models of potential receptors. (2.3.3.e.V.1.)

**RESPONSE:** Models typically provide a predictive tool when data is scarce or unobtainable. At Techalloy, extensive sampling and historical data supports the conclusions regarding potential receptors.

✓ **COMMENT:** Resolve the inconsistency between PRC's work and later work by Techalloy. (2.3.3.e.V.2.)

**RESPONSE:** The use of the word "inconsistent" does not imply a data quality problem. Instead, it merely signals that while the Techalloy constituents are VOCs; the problem at the well consists of something else. Alternative potential sources may be the source of the observed contamination. The PRC report does not indicate sampling methods. The QAPP, at page 2-46, now avoids the use of the term "inconsistent."

Mr. Joseph M. Boyle  
U.S. EPA

-9-

23 March 1994

✓ **COMMENT:** Specify objectives and dependent decisions. (2.4.1.a.)

**RESPONSE:** The QAPP now describes objectives in detail, beginning at page 2-47.

✓ **COMMENT:** Describe the statistical evaluation in greater detail (2.4.1.b.)

**RESPONSE:** The QAPP text, at page 2-48, now contains a reference to an introductory statistics book.

✓ **COMMENT:** Expand the description of purposes to describe compounds, trigger levels, locations, numbers of samples. (2.4.1.c.I.)

**RESPONSE:** The statement of purpose ordinarily discusses just the purpose of the work. Methods are usually discussed elsewhere, since methods do not define the work's purpose. WESTON requests that U.S. EPA accept this traditional arrangement, as it provides a clear and logical arrangement of the plans. The QAPP, at page 2-47 et seq., now provides much greater detail in the purpose section, in response to U.S. EPA's request. The details of implementation, however, are reserved for later discussions of methods.

✓ **COMMENT:** Expand the description of purposes to explain what constitutes "sufficient information." (2.4.1.c.I.3.)

**RESPONSE:** The QAPP text, at page 2-47 et seq., now describes what constitutes sufficient information.

✓ **COMMENT:** Explain what specific decisions each result supports. (2.4.1.c.I.4.)

**RESPONSE:** The DQO table establishes the relationship between decisions and results.

✓ **COMMENT:** Expand the description of purposes to describe how results will be incorporated into the CMS. (2.4.1.c.I.5.)

**RESPONSE:** The QAPP, at page 2-47 et seq., now describes how results will be incorporated into the CMS.

✓ **COMMENT:** Expand the description of purposes to describe incorporation of the results of Phase I into Phase II. (2.4.1.c.6.)

**RESPONSE:** The QAPP now describes incorporation of the results of Phase I into Phase II.

Mr. Joseph M. Boyle  
U.S. EPA

-10-

23 March 1994

✓ **COMMENT:** For each activity that generates data, identify the use of that data. (2.4.2.a.)

**RESPONSE:** The DQO table, Table 2-14, already identifies the use for all data.

✓ **COMMENT:** Identify Project Target Parameters based on legal agreements and activities at the facility. (2.4.2.b.I. and 2.4.2.b.II.)

**RESPONSE:** The QAPP, at Tables 2-12.1 through 2-12.3 now identifies Project Target Parameters based on IEPA's cleanup objectives. Asterisks mark such parameters. Additional parameters are provided as a conservative measure to assure that other, unexpected compounds do not inadvertently escape detection.

✓ **COMMENT:** State that the Project Target Parameters are the compounds that may be found at the facility. (2.4.2.b.III.)

**RESPONSE:** The QAPP now states that the Project Target Parameters include even more than the compounds expected at the facility.

**COMMENT:** Specify SVOCs to be analyzed. (2.4.2.c.)

\* **RESPONSE:** A new table, Table 2-12.2, identifies the SVOCs. The action limits, as previously agreed upon in the pre-QAPP meeting of 23 March 1993, are defined as the CRQLs. The SAP lists the CRQLs for every compound.

\* **COMMENT:** Identify the number and location of the background samples. Define how the background samples will be used. (2.4.2.d.)

**RESPONSE:** The QAPP text, at page 2-49, explains that the FSP identifies the number and location of the background samples.

✓ **COMMENT:** Identify project target limits for field parameters. (2.4.2.1)

**RESPONSE:** The QAPP, at page 2-49, explains that field parameters are only for health and safety and determining when to sample after purging. Furthermore, the QAPP, at Section 4.2, specifies the accuracy of field equipment. As a result, project target limits are not needed for them.

**COMMENT:** Identify project target limits for laboratory parameters. (2.4.2.2)

Mr. Joseph M. Boyle  
U.S. EPA

-11-

23 March 1994

**RESPONSE:** At the pre-QAPP meeting, U.S. EPA agreed that CRQLs would serve as the the project target limits.

✓ **COMMENT:** Specify data quality objectives for each step of the project. (2.4.3)

**RESPONSE:** The DQO table, Table 2-14, specifies data quality objectives.

✓ **COMMENT:** Identify what BG-5 contains. (2.5.1.a.I.)

**RESPONSE:** The QAPP explains that BG-5 contains aliphatic hydrocarbons.

✓ **COMMENT:** Explain whether the BG-5 has been analyzed. (2.5.1.a.I.)

**RESPONSE:** The QAPP makes clear that the BG-5 area has not been analyzed.

✓ **COMMENT:** State whether samples will be oily. (2.5.1.a.I.)

**RESPONSE:** The QAPP states that the samples will be oily.

✓ **COMMENT:** Describe what consideration will be exercised for the samples. (2.5.1.a.I.)

**RESPONSE:** The HASP describes the consideration that will be exercised for all samples.

✓ **COMMENT:** Describe why the various SWMUs require unique numbers of samples. (2.5.1.a.II.)

**RESPONSE:** The QAPP now explains that large SWMUs require more samples than small ones.

✓ **COMMENT:** Describe whether the number of samples comports with the statistical method. (2.5.1.a.III.)

**RESPONSE:** The t-statistic works best with more than about five data points. Additional samples are helpful. The FSP provides at least six.

✓ **COMMENT:** Describe why soils are not to be analyzed for SVOCs. (2.5.1.b.)

**RESPONSE:** In response to U.S. EPA's new concern, the QAPP now provides analyses for SVOCs. However, these new analyses are contrary to the agreement reached during the

Mr. Joseph M. Boyle  
U.S. EPA

-12-

23 March 1994

pre-QAPP meeting of 23 March 1993. At that time, U.S. EPA had agreed to limiting SVOC analyses to just groundwater. (2.5.1.b.)

✓ **COMMENT:** Describe why TPH is not analyzed, even when it was detected before. (2.5.1.c.)

**RESPONSE:** The QAPP specifies analyses capable of distinguishing individual petroleum constituents, such as benzene, toluene, ethylbenzene, an xylene. Such measurements are more direct than TPH, which reduces information about many compounds to a single number.

✓ **COMMENT:** Use a slow-flow pump for purging and sampling. (3.1.a.I.)

**RESPONSE:** In response to U.S. EPA's new concern, the FSP, at pages 3-6 and 3-7, now provides a slow-flow peristaltic pump for purging and sampling at soil probe locations. However, the new means of withdrawing samples is contrary to the method U.S. EPA requested during the pre-QAPP meeting of 23 March 1993. During the pre-QAPP meeting, U.S. EPA specifically asked for a bottom-delivery bailer.

✓ **COMMENT:** Collect groundwater samples after field readings stabilize. (3.1.a.II.)

**RESPONSE:** The FSP, at page 3-6, now specifies that readings must stabilize before data can be collected.

✓ **COMMENT:** Analyze both filtered and unfiltered metals. (3.1.a.III.)

**RESPONSE:** The basis for this comment is unclear. The FSP has always specified analyzing both filtered and unfiltered metals. The FSP continues to do so.

✓ **COMMENT:** Use better sampling procedures to minimize exposure to the atmosphere. (3.1.b.)

**RESPONSE:** The reviewer has not provided any suggestions for a better procedure, so it is unclear what would be better. If, for instance, brass sleeves were used within the split spoons, several areas within the spoons would be inaccessible. The QAPP's existing procedures call for collecting samples immediately upon the spoon's opening. Rapid collection minimizes atmospheric exposure.

✓ **COMMENT:** Use a trip blank for both water and soil. (3.1.c.)



Mr. Joseph M. Boyle  
U.S. EPA

-13-

23 March 1994

**RESPONSE:** Originally the FSP only called for water trip blanks for each shipping container of water. The FSP, at page 4-3, now also specifies water trip blanks for each shipping container of soil.

✓ **COMMENT:** Expect a comparison of laboratory SOPs against project objectives. (4.1 and 4.2.1 -- gap in outline exists in original.)

**RESPONSE:** U.S. EPA agreed to the use of CLP-type SOPs at the pre-QAPP meeting of 23 March 1993. No additional evaluation is warranted. WESTON trusts that the SOPs will be acceptable as agreed.

✓ **COMMENT:** Provide reports on the progress of the work and the satisfaction of DQOs. (5.1.)

**RESPONSE:** The QAPP now includes progress reports on the work and DQOs.

If you have any questions, feel free to call WESTON. Again, we look forward to conducting field work this summer.

Very truly yours,

ROY F. WESTON, INC.

Carlos J. Serna, P.G.  
Senior Project Manager

cc: Bill Buller, U.S. EPA  
Henry Lopes, Techalloy  
Rick Perlick, Techalloy



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590


REPLY TO THE ATTENTION OF:

**MEMORANDUM**

**SQ-14J**

**Date:** NOV 24 1993

**Subject:** Review of Revision Zero for the Quality Assurance Project Plan (QAPP) for RCRA Facility Investigation of Techalloy Company, Inc., Union, Illinois

**From:** George Schupp, Chief  
Quality Assurance Section 

**To:** Susan Sylvester, Chief  
IL/IN Technical Enforcement Section

**Attention:** William Buller, RCRA Project Coordinator

The Quality Assurance Section (QAS) has reviewed the subject QAPP which was received by the QAS on October 15, 1993 (QAS Log-in No R161). The QAS does not recommend the approval of the subject QAPP at this time.

The attached comments itemize the QAPP deficiencies and provide guidance for their correction. If Mr. Buller does not submit our comments as is, we recommend he discuss his final comments with us. We recommend that Mr. Buller request Techalloy through their contractors to submit the response to our comments and include the corrected pages only. If there are any questions regarding this memorandum, Mr. Buller can call Al Alwan, of my staff, at 353-2004.

**Attachment**

**CC:** D. Wesolowski, SLL-10C  
M. DeRosa, HRE-8J

QAS comments on Techalloy Inc., Union, IL

1.0 TITLE AND APPROVAL PAGE

- a. Change the name for the Regional Quality Assurance Manager to Willie Harris.
- b. The laboratory QA Manager should be added.

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

2.1.1 OVERALL PROJECT OBJECTIVES

This section is missing, please provide specific information.

2.1.2 PROJECT STATUS/PHASE

This section is missing, please provide specific information.

2.2 SITE/FACILITY HISTORY

2.2.1 PAST DATA COLLECTION ACTIVITIES

- a. Provide the specific analytical methods that were used, with compounds and detection limits, for all analysis.
- b. Specify the sampling technique used to collect the historical data.
- c. Summarize the results of past activities we are not familiar with these investigations and the approach that was used.
- d. Explain why only dissolved metals were used to trace the metals mobility.
- e. What are the limitations of the "Groundwater probe-headspace" technique? Provide specifics on the capability.
- f. Table 2-8 page 2-24/56, what does "on-site off-site objective" mean, please explain.
- g. Section 2 page 40, explain why TCLP metals were used to characterize the soil?

QAS comments on Techalloy Inc., Union, IL

- h. Figure 2-10 page 33, we can not locate TT3 and TT4, please provide direction.
- i. Section 2 page 40, Drum Storage area:
  - I. What is the status of these drums, i.e., are they leaking, how big are they, what was stored in them, have they been characterized?
  - II. It was not clear what work has been done on this area that made the contractor conclude that only volatile compounds and metals were found. Please explain if chemical analysis was performed and if so what analytical methods were used.

2.3.3 CURRENT STATUS

- a. Summarize what is the current status?
- b. Had a geological model been drawn for the plume location? If one has been done please provide, if not we recommend preparing and providing one for this phase.
- c. Section 2 page 38, in the discussion of the "source areas", explain how could the contractor come to conclusion about the contamination distribution if "the precise spatial distribution are not known"?
- d. Table 2-11 page 41, the previous three closure SWMUs, why there were no volatile or other organic compounds?
- e. Tables 2-12 page 42-44, the five SWMUs:
  - I. Confirmatory samples must be taken and analyzed for specific Project Target Limits (using the right analytical methods) to establish what are the contaminant at Techalloy.
  - II. What sampling technique used to determine the migration pathways?
  - III. Provide the number of samples, locations and analytical methods used to determine the conclusion for the chemical

**QAS comments on Techalloy Inc., Union, IL**

- IV. If bailers used and only filtered samples were analyzed the migration pathways for metals is questionable. Provide specifics on what has been done.
- V. Section 2 page 45&46 potential receptors:
  - 1. Is there a model that will support the conclusion? Provide information.
  - 2. What were the sampling and analysis used by PRC consultant and Techalloy? The information may be used to answer the inconsistency in the results.

**2.4 PROJECT OBJECTIVES**

**2.4.1 SPECIFIC OBJECTIVES AND ASSOCIATED TASKS**

- a. Specify the objectives for each task and define what decision will be made on each results.
- b. Section 2 page 48, the use of evaluation and statistics is very good idea. But it is not clear how that will be done for Techalloy Facility, please specify. We encourage the contractor to depend on the False Positives and Negatives in deciding the number of samples for each decision they need to make.
- c. Section 2.3 page 46, the purpose of the RFI as stated should be expended. The following is an example on one purpose. We recommend that this to be followed for the reset.
  - I. Purpose number 1: "gather sufficient information to determine the vertical and horizontal extent and magnitude of constituents in the five SWMUs".
    - 1. What compounds, at what levels and for which matrix will trigger each decision.
    - 2. Location and number of samples needed to make a decision on both

QAS comments on Techalloy Inc., Union, IL

the vertical and horizontal.

3. Specify what will satisfy the "sufficient information" at this stage of the project. This is the time and place to include the different possibilities. One cannot change as the implementation in process.
4. What are the specific decisions that have to be made for each results collected.
5. Specifically how the results will be incorporated in the Corrective Measures Study.
6. How does the results of Phase I will incorporated in Phase II.

2.4.2 PROJECT TARGET PARAMETERS AND INTENDED DATA USAGES

- a. The intended data use must be specified for each data generations activities.
- b. The Project Target Parameters and their limits for each matrix must be listed here. This list must not be referenced to SOP, CLP or SW846 analytical methods. Techalloy must come up with this list based on:
  - I. Any legal agreement that has been signed with Federal or State agencies. This could be the same as the "State Cleanup objectives for Techalloy, Inc. October 7, 1991" or any others.
  - II. Information based on the activities at the Techalloy facility, chemical processes and the raw materials used.
  - III. Techalloy has to state that based on their information this is the compounds list out of Appendix 9 that may be found on the facility.
- c. Section 2 page 48, specify the semivolatile compound that will be analyzed with the

## **QAS comments on Techalloy Inc., Union, IL**

action limits for each matrix.

- d. Section 2 page 49, provide the number and location with specific definition of how the background samples will used.

### **2.4.2.1 FIELD PARAMETERS**

If there are any chemical parameters, provide specific project target limits for each matrix.

### **2.4.2.2 LABORATORY PARAMETERS**

- a. See comment 2.4.2 above.

### **2.4.3 DATA QUALITY OBJECTIVES (DQO)**

Specify the objectives for each step of this project with the associated decision that will be made for the results. These DQOs should be specifics and measurable, i.e., the DQOs degree of satisfaction could be assessed and reported as the project progress.

## **2.5 SAMPLE NETWORK DESIGN AND RATIONALE**

### **2.5.1 SAMPLE NETWORK BY TASK AND MATRIX**

- a. Table 2-13 page 50:

- I. Is information available about what does the Oil contain in Area BG-5? Was any Oil analysis for BG-5 Area done? Is soil samples will have some Oil? What consideration will be exercised for those samples?
- II. What is the rational for using different number of samples for each Area?
- III. Is the number of samples for each units was considered in term of the statistical test that was proposed?

- b. What is the rational to analyze for semivolatile in ground water and not in the soils where one might expect to find them?

## **QAS comments on Techalloy Inc., Union, IL**

- c. What is the rational for not analyzing for Total Petroleum Hydrocarbon specially when it was detected before?

### **3. SAMPLING PROCEDURES**

#### **3.1 Field QC Sample Collection/Preparation Procedures**

- a. Section 3.2 page 6:
  - I. Recommend the use of slow flow rate pump for both purging and sampling ground water.
  - II. Recommend the sampling be done after the Turbidity, Dissolved Oxygen and Redox has been stabilized.
  - III. The ground water samples for metals should be analyzed for both filtered and unfiltered samples.
- b. Section 3.6 page 14, recommend the use of better sampling procedures, the new procedure should minimize the atmospheric exposure of soil sample both during sampling, containerized and transportation.
- c. Section 4.4 page 3, recommend the use of Trip blank for each shipment of samples that will be analyzed for volatile organic compound both water and soil.

### **4.0 ANALYTICAL AND MEASUREMENT PROCEDURES**

#### **4.1 Laboratory Analytical & Measurement Procedures**

When the Project Target Limits has been submitted (see comment 2.4.2 above) the laboratory SOPs will be evaluated to see if it could achieve the Project objectives.

##### **4.2.1 List of Project Target Compounds & Detection Limits**

Each SOP must have all the compounds of interest at the level needed.

### **5.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT**

#### **5.1 Contents of Project QA Reports**

**QAS comments on Techalloy Inc., Union, IL**

Recommend including the Data Quality Assessment as an item to report on, i.e., what are the progress and how far are the Data Quality Objectives been satisfied.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION VDATE: 9/7/93

SUBJECT: Request for Evaluation of Quality Assurance Project Plan

FROM: Joe Doyle, Chief  
RCRA Enforcement (Permits) BranchTO: Valerie Jones, Chief  
Regional Quality Assurance Manager

A Quality Assurance Project Plan (QAPP) has been received for sampling and analysis to be done under a RCRA Facility Investigation (RFI) (or Corrective Measures Study, (CMS)). A Pre-QAPP meeting was held on \_\_\_\_\_ regarding this facility. Please review this QAPP with particular attention to the technical aspects, including appropriate parameters, methods, and detection limits. The technical contact named below can discuss any facility specific issues which characterize this facility. Please complete this review within thirty (30) calendar days from receipt, with a goal of twenty-one (21) days, if possible.

Facility Name: Techalloy State: FL  
RCRA Project Coordinator: Bill Buller Phone: 6-4568  
Section Chief: Susan Sylvestre

*Only one copy available for review.*

RECEIVED  
SEP 08 1993  
QUALITY ASSURANCE SECTION  
ENVIRONMENTAL SCIENCES DIV.

Attachments

cc: Chuck Elly, Director, CRL (w/attachments)

Note: See page 7 of  
Memorandum of Agreement -  
Item 2

DATE:

SUBJECT: Review Request of Revision 0 Quality Assurance  
Project Plan (QAPjP) of the RCRA (RFI/CMS) at  
TECH alloy

FROM: George C. Schupp, Chief  
Quality Assurance Section

GAS LOGIN NUMBER R161  
DUE DATE 11-15-93  
ASSIGNED TO ALWAN

TO: Chi Tang, Chief  
Organic Analysis Section (SE-100)

The Quality Assurance Section is requesting comments from the Central Regional Laboratory regarding the analytical, chain-of-custody and data reduction/validation/reporting aspects of the subject QAPjP necessary to conduct a laboratory audit.

Please find attached one copy of the QAPjP and all associated plans for your review. The QAS requests that all comments be provided by C.O.B. \_\_\_\_\_.

The QAS **has not** completed its review of the QAPjP. A copy of QAS' comments **will be forwarded when they are completed.** provide both a hardcopy & diskette version to expedite incorporation of the CRL's comments for the QAS' memorandum to the Office of RCRA.

ATTACHMENT(S): Revision 0 QAPjP

Alwan  
30 days for Fody

AG

SLO-10C

SUBJECT: REVIEW OF TECHALLOY RFI DRAFT QUALITY ASSURANCE PROJECT PLAN

FROM : LINDA S. EVANGELISTA - CHEMIST, ORGANIC SECTION, CRL *LE*

THROUGH: CHI TANG - ORGANIC LABORATORY SECTION CHIEF *Chi Tang*

TO : GEORGE SCHUPP - QUALITY ASSURANCE SECTION CHIEF

DATE : NOVEMBER 3, 1993

INTRODUCTION:

The Central Regional Laboratory has completed a review of the subject QAPP. The review is based on the following QAPP information:

1. Purpose of RFI - determine the extent of contamination, vertical and lateral, in five subject SWMUs, assess potential releases from these SWMUs and determine extent of constituent migration in groundwater
2. Intended data usage - evaluate appropriate, viable remedial action alternatives in a CMS based on RFI data
3. Parameters of concern - VOCs ( DCA, DCE, TCA, TCE, PCE, and others ) and metals (such as, chromium, lead, nickel, copper), other inorganics, such as cyanide, were detected during previous soil and groundwater analysis. Petroleum hydrocarbons were also detected. The facility had used chlorinated solvents, lead coatings and high viscosity oils in the past. There was no history of SVOCs use at the site; however, one monitoring well sample was analyzed and no SVOCs were detected above MDLs.
4. Project specific compounds are VOCs and inorganic parameters. Some SVOCs analysis will be performed as a confirmatory measure. The laboratory named in the QAPP is Weston-Gulf Coast Laboratories and the proposed analytical methods are the CLP SOW OLM01.8 for organics and ILM02.1 for inorganics.

## REVIEW SUMMARY:

The draft QAPP is not acceptable in its present form. The contractor needs to address the following review comments.

## COMMENTS, QUESTIONS, CONCERNS:

1. Are there action levels or clean-up objectives for the sites ( or SWMUs ) being proposed or required? On what level of contamination will a decision be made to do a CMS and subsequently corrective action? This is important in determining whether the CLP analytical methods are sensitive enough. There were several analysis results tables from previous groundwater investigations given in the QAPP that included clean-up objectives for specific target compounds where some of the values are lower than the CRQLs. For example, clean-up objective for 1,1-DCE was 7 ug/L while the CRQL for the method being proposed for this RFI is 10 ug/L. Our concern is that the action levels may be lower than the CLP CRQLs in which case a more sensitive method should be used. The QAPP should clearly delineate what method detection limits would satisfy the intended data usage and the laboratory has to show that these limits are achievable by the method they will propose. Furthermore, there is mention of a risk assessment for the facility to be conducted by Weston based on Phase 1 RFI data, which makes the choice of methods even more crucial. Please provide us with the necessary information for both organic and inorganic parameters of concern.
2. Method 8260 has been proposed for the analysis of residential well waters [ Private Wells Sampling Plan (PWSP) ]. Is there a reason why vinyl chloride ( one of Method 8260 target compounds ) will be analyzed using Method 8010? It seems strange especially since it is the only compound being analyzed with a different method. Also, information as to clean-up objective or MCLs will have to be provided in order to determine if Method 8260 detection limits for VOCs of 0.5 ug/L are reasonable.
3. Appendix E include an OSWER document on " Specifications and Guidance For Obtaining Contaminant-Free Sample Containers ". The CRQLs for VOCs analysis range from 1 ug/L for most compounds to 2 & 5 ug/L for some compounds and are based on CLP Organic Low Concentration SOW ( 1990 ). It does not seem appropriate to use sample containers where levels of VOCs are reported as < 1 ug/L when the method being used to analyze samples placed in these containers is at a CRQL of 0.5 ug/L. Although, SVOCs analysis will be performed for confirmation only, some of the CRQLs for the sample container analysis seem rather high at 20 ug/L.

4. Since petroleum hydrocarbons were detected in the past, will TPH analysis be performed? If so, the method will have to be submitted.
5. Section 4.2 of the QAPP describes how precision will be assessed by WESTON. However, it is also mentioned that RPDs for field duplicates will be calculated but will not be assessed since the USEPA Laboratory Data Validation Functional Guidelines does not have review criteria for field duplicates comparability. We recommend that the contractor should have its own criteria for assessment of field duplicate data.
6. We noted the use of "cocktails" in describing calibration standards and "recipes" used in preparations of these cocktails. This is not a problem; just interesting and noteworthy.
7. In Section 4.3, the QAPP refers to an equation for % completeness but the equation is missing. The paragraph on representativeness is likewise missing.
8. In section 3.4.7, clarify that the sample log-in personnel will check the temperature of the container the sample bottles were shipped in and not of the individual sample containers.
9. Minor Errors observed: Page 2-8 of the Field Sampling Plan is missing. Page 2-13, fourth paragraph, change "oil" to "soil" in the statement "... cyanide is not included in any other oil or groundwater analysis." Section 4.2, page 4-2, the statement " Duplicate samples will be analyzed for the same parameters as the investigative samples. " appear twice.

#### LABORATORY EVALUATION :

WESTON-Gulf Coast Lab. was evaluated by Dr. Chi Tang in April 1992. Most of the analytical methods that the laboratory follows were either acceptable with corrective action or acceptable without any corrective action for the project that the lab was involved in at the time of the evaluation. It may not be necessary to conduct an on-site evaluation. Once the above QAPP review concerns/questions are addressed, then we should be able to determine the acceptability of the procedures proposed. During that time, we may just have to make follow-up telephone calls to the laboratory or request more documentation in order to determine whether Weston-Gulf Coast is acceptable for the Techalloy RFI.

If you have any questions, please call Linda Evangelista at 3-4331.

cc: Dennis Wesolowski

Post-It<sup>®</sup> brand fax transmittal memo 7671

# of

Received 11/17/93

To <b>BILL BAUER</b>	From <b>KEVIN LESKO</b>
Co. <b>USEPA - REGION V</b>	Co. <b>EPA</b>
D. <b>RE-83</b>	Phone # <b>217/524-3271</b>
F. <b>12/353-4788</b>	Fax # <b>217/524-3291</b>

ATTACHMENT 2

Page 1 of 2

 U.S. EPA CENTRAL REGIONAL LAB.  
 575 S. CLARK STREET  
 CHICAGO, ILLINOIS 60605

(Corrected March 5, 1992)

Cleanup Objectives for Techalloy, Inc. October 7, 1991Closure Log # C-548-M-3

Parameter	Soil Objective (mg/kg)	Groundwater Objective (mg/l)
Nitrate	NA	10.0
Sulfate	NA	400
Cyanide	0.2 *	0.2
Copper	0.65 **	0.65
Barium	2.0 **	2.0
Cadmium	0.005 **	0.005
Chromium	0.1 **	0.1
Lead	0.0075 **	0.0075
Mercury	0.002 **	0.002
Selenium	0.05 **	0.05
Nickel	0.1 **	0.1
Methylene Chloride	0.005	0.005 and mixture 1
Acetone	0.7	0.7
2-Butanone	0.350	0.350
Benzene	0.005	0.005
Toluene	1.0	1.0
Ethylbenzene	0.7	0.7
Xylene (total)	10.0	10.0
1,1,1 Trichloroethane	0.2	0.2
1,1,2 Trichloroethane	0.005	0.005
Tetrachloroethylene	0.005	0.005 and mixture 1
Trichloroethylene	0.005	0.005 and mixture 1
1,1-Dichloroethylene	0.007	0.007 and mixture 2
1,1-Dichloroethane	0.7	0.7
1,2-Dichloroethane	0.005	0.005 and mixture 1
Vinyl Chloride	0.002	0.002 and mixture 1
cis 1,2-Dichloroethylene	0.07	0.07 and mixture 2
trans 1,2-Dichloroethylene	0.1	0.1 and mixture 2

\* Soil objectives for cyanide is based on the Toxicity Characteristic Leaching Procedure (Method 1311 of SW-846), conducted at a neutral pH, with results in mg/l.

\*\* Soil objectives for metals are based on the Toxicity Characteristic Leaching Procedure, with results in mg/l.

NA - A soil cleanup objective is not applicable to this parameter.

page 2

Mixture 1: In addition to meeting the individual Class I groundwater objectives indicated in the previous table, the following equation must be satisfied in order to protect against liver tumors.

$$\frac{[1,2\text{-Dichloroethane}]}{0.005 \text{ mg/l}} + \frac{[\text{Tetrachloroethylene}]}{0.005 \text{ mg/l}} + \frac{[\text{Trichloroethylene}]}{0.005 \text{ mg/l}} + \frac{[\text{Vinyl Chloride}]}{0.002 \text{ mg/l}} \leq 1.0$$

Mixture 2: In addition to meeting the individual Class I groundwater objectives indicated in the previous table, the following equation must be satisfied in order to protect against liver toxicity.

$$\frac{[1,1\text{-Dichloroethylene}]}{0.007 \text{ mg/l}} + \frac{[\text{cis } 1,2\text{-Dichloroethylene}]}{0.07 \text{ mg/l}} + \frac{[\text{trans } 1,2\text{-Dichloroethylene}]}{0.1 \text{ mg/l}} \leq 1.0$$

## LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
2-1	Site Location Map	2-2
2-2	Facility Feature Map	2-3
2-3	Groundwater Elevation Contour Map	2-8
2-4	Previous RCRA Facility Closure Plan SWMUs	2-14
2-5	Phase I Soil Sample Locations	2-16
2-6	Phase II Soil Sample Locations	2-21
2-7	Phase I Groundwater Sample Locations	2-25
2-8	Phase I Off-site Groundwater Sample Locations	2-26
2-9	Phase I Follow-up Wells	2-29
2-10	Groundwater Probe and Auger Concentration Distribution Phase II Groundwater Investigation	2-33
2-11	Monitoring Wells for Three Previous SWMUs	2-37
2-12	Project Schedule	2-56
3-1	Project Organization	3-2
6-1	Chain-of-Custody Record - Gulf Coast Laboratories	6-4
6-2	Chain-of-Custody Seals - Gulf Coast Laboratories	6-6
6-3	Sample Container Labels - Gulf Coast Laboratories	6-7
6-4	Sample Extraction Record - Gulf Coast Laboratories	6-15
11-1	Field Audit Checklist Example	11-2
11-2	Monthly Audit Checklist Example - Gulf Coast Laboratories	11-7
14-1	WESTON/Gulf Coast Laboratories Corrective Action Documentation Form	14-5
14-2	WESTON/Gulf Coast Laboratories Sample Discrepancy Report Form	14-6
14-3	Critical Path for Laboratory Corrective Action	14-9

## LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
2-1	Phase I Soil Investigation Results	2-17
2-2	Phase I Soil Investigation VOC Results	2-19
2-3	Phase II Soil Investigation -- Sample Location/Rationale	2-20
2-4	Phase II Soil Probe Analytical Results	2-22
2-5	Phase I Groundwater Investigation Results (January 1990)	2-27
2-6	Phase I Follow-up Groundwater Investigation Results (April 1990)	2-30
2-7	Phase I Follow-up Groundwater Investigation Results (August 1990)	2-32
2-8	Phase II Groundwater Probe - Headspace Analytical Results	2-34
2-9	Phase II Groundwater Auger Samples Analytical Results	2-35
2-10	Previous RCRA Closure Groundwater Investigation (July 1992)	2-39
2-11	Previous RCRA Closure SWMUs	2-41
2-12	SWMUs Addressed by the Present RFI	2-42
2-13	Summary of Sampling Effort	2-50
2-14	RFI Data Quality Objective	2-55
4-1	Quality Assurance Objectives for Organic Surrogate Analysis	4-6
4-2	Summary of Precision, Accuracy and Completeness Objectives	4-7
7-1	Summary of Instrument Calibration Procedures	7-4
8-1	Selected Appendix IX Volatile Organic Compounds, CRQLs	8-2
8-2	Analytical Reporting Limits - Selected Appendix IX Inorganics	8-4
8-3	Selected Appendix IX Semivolatile Organic Compounds, CRQLs	8-5
9-1	Inorganic Instrument Performance Indicators	9-3
9-2	Organic Performance Indicators	9-4.1
12-1	Equipment and Maintenance	12-4

## LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
2-1	Phase I Soil Investigation Results	2-17
2-2	Phase I Soil Investigation VOC Results	2-19
2-3	Phase II Soil Investigation -- Sample Location/Rationale	2-20
2-4	Phase II Soil Probe Analytical Results	2-22
2-5	Phase I Groundwater Investigation Results (January 1990)	2-27
2-6	Phase I Follow-up Groundwater Investigation Results (April 1990)	2-30
2-7	Phase I Follow-up Groundwater Investigation Results (August 1990)	2-32
2-8	Phase II Groundwater Probe - Headspace Analytical Results	2-34
2-9	Phase II Groundwater Auger Samples Analytical Results	2-35
2-10	Previous RCRA Closure Groundwater Investigation (July 1992)	2-39
2-11	Previous RCRA Closure SWMUs	2-41
2-12	SWMUs Addressed by the Present RFI	2-42
2-12.1	VOC Project Target Parameters	2-42.1
2-12.2	SVOC Project Target Parameters	2-42.2
2-12.3	Inorganic Project Target Parameters	2-42.3
2-13	Summary of Sampling Effort	2-50
2-14	RFI Data Quality Objectives	2-55
4-1	Quality Assurance Objectives for Organic Surrogate Analysis	4-6
4-2	Summary of Precision, Accuracy and Completeness Objectives	4-7
7-1	Summary of Instrument Calibration Procedures	7-4
8-1	Selected Appendix IX Volatile Organic Compounds, CRQLs	8-2
8-2	Analytical Reporting Limits - Selected Appendix IX Inorganics	8-4
8-3	Selected Appendix IX Semivolatile Organic Compounds, CRQLs	8-5
9-1	Inorganic Instrument Performance Indicators	9-3
9-2	Organic Performance Indicators	9-4.1
12-1	Equipment and Maintenance	12-4

**TECHALLOY RFI QUALITY ASSURANCE PROJECT PLAN**  
**DISTRIBUTION LIST**

Distribution:

3 Copies	William Buller, United States Environmental Protection Agency
3 Copies	Kevin Lesko, Illinois Environmental Protection Agency
1 Copy	Henry Lopes, Techalloy Company, Inc.
1 Copy	Richard Perlick, Techalloy Company, Inc.
3 Copies	Roy F. Weston, Inc.

## SECTION 1 INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA) requires that all environmental monitoring and measuring efforts mandated or supported by the U.S. EPA participate in a centrally managed quality assurance (QA) program. Any party generating data under this program has the responsibility to implement minimum procedures to ensure that the precision, accuracy, completeness, and representativeness of its data are known and documented. To ensure that the responsibility is met uniformly, each party must prepare a written Quality Assurance Project Plan (QAPP) for each project that it is to perform.

This QAPP presents the organization, objectives, functional activities, and specific Quality Assurance and Quality Control (QA/QC) activities associated with the RCRA Facility Investigation (RFI) at the Techalloy Company, Inc. (Techalloy) Facility in Union, Illinois (hereinafter referred to as the Techalloy facility). This QAPP also describes the specific protocols that will be followed for sampling, sample handling and storage, chain-of-custody, laboratory analysis, hydrogeologic testing, and field investigative activities.

All QA/QC procedures will be in accordance with applicable professional technical standards, U.S. EPA requirements, government regulations and guidelines, and project-specific goals and requirements. This QAPP has been prepared by Roy F. Weston, Inc. (WESTON®) on behalf of Techalloy in accordance with U.S. EPA's guidance established in the following documents:

- U.S. EPA, *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, QAMS-005/80.

- U.S. EPA Region V, *Content Requirements for RCRA Facility Investigation Assurance Project Plans*, Revision 3 October 1990.
- U.S. EPA Region V, *RCRA Model Quality Assurance Project Plan*, May 1991.

## **SECTION 2**

### **PROJECT DESCRIPTION**

#### **2.1 FACILITY LOCATION HISTORY AND BACKGROUND INFORMATION**

##### **Overall Project Objectives**

The overall project objectives, as stated in the Order of Consent (AOC), Section III, Statement of Purpose, are

- "Perform a RCRA Facility Investigation to determine fully the nature and extent of any release of hazardous wastes and hazardous constituents from the facility."
- "Perform a Corrective Measures Study (CMS) to identify and evaluate alternatives for the corrective action necessary to prevent or mitigate any migration or release of hazardous wastes or hazardous constituents from or at the facility."
- Perform Interim Measures (IM) at the facility if current or potential threats to human health or welfare or the environment are identified."

##### **Project Status/Phase**

The project stands at the outset of an RFI. An interim corrective action for groundwater takes place concurrently with the RFI.

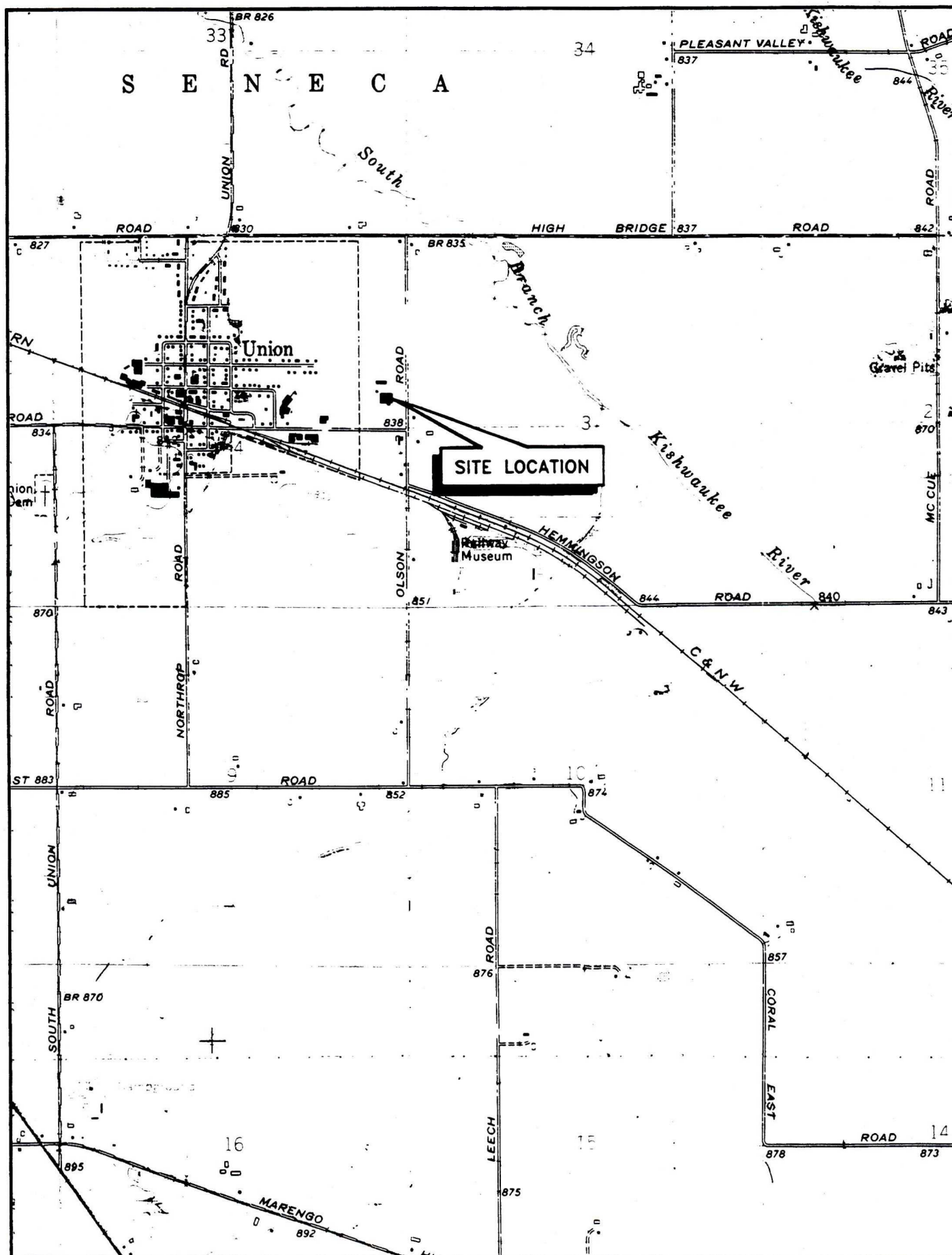
##### **Facility Description**

The Techalloy facility is located at the intersection of Olson and Jefferson Roads in the Village of Union, McHenry County, Illinois. The Techalloy facility is located in the SE ¼, SE ¼, NW ¼, Section 4, Township 43 North, Range 6 East (Figure 2-1). The developed

portion of the facility occupies 5 acres. The Techalloy facility includes an additional 29 acres of agricultural land surrounding the facility (Figure 2-2).

### **Topography and Drainage**

The Techalloy facility is located in southwest McHenry County in the Wheaton Morainal Country of the Great Lake Section of the Central Lowland Province. The Wheaton Morainal Country is characterized by complex morainal topography with greater relief and a more complicated slope pattern than most of northeastern Illinois. Irregularly shaped hills, mounds, and ridges are intermingled with basins, marshes and occasional lakes. The drainage pattern is geologically young and incomplete. Within this hilly morainal area, there are sizable level to gently sloping outwash plains. The Techalloy facility is situated on the southern fringe of an outwash plain. The outwash plain is dissected by the South Branch of the Kishwaukee River, which flows from the southeast to the northwest and lies approximately ½ mile northeast of the site. The western portion of McHenry County is drained by the Kishwaukee River and its tributaries. Drainage is westward to the Rock River.



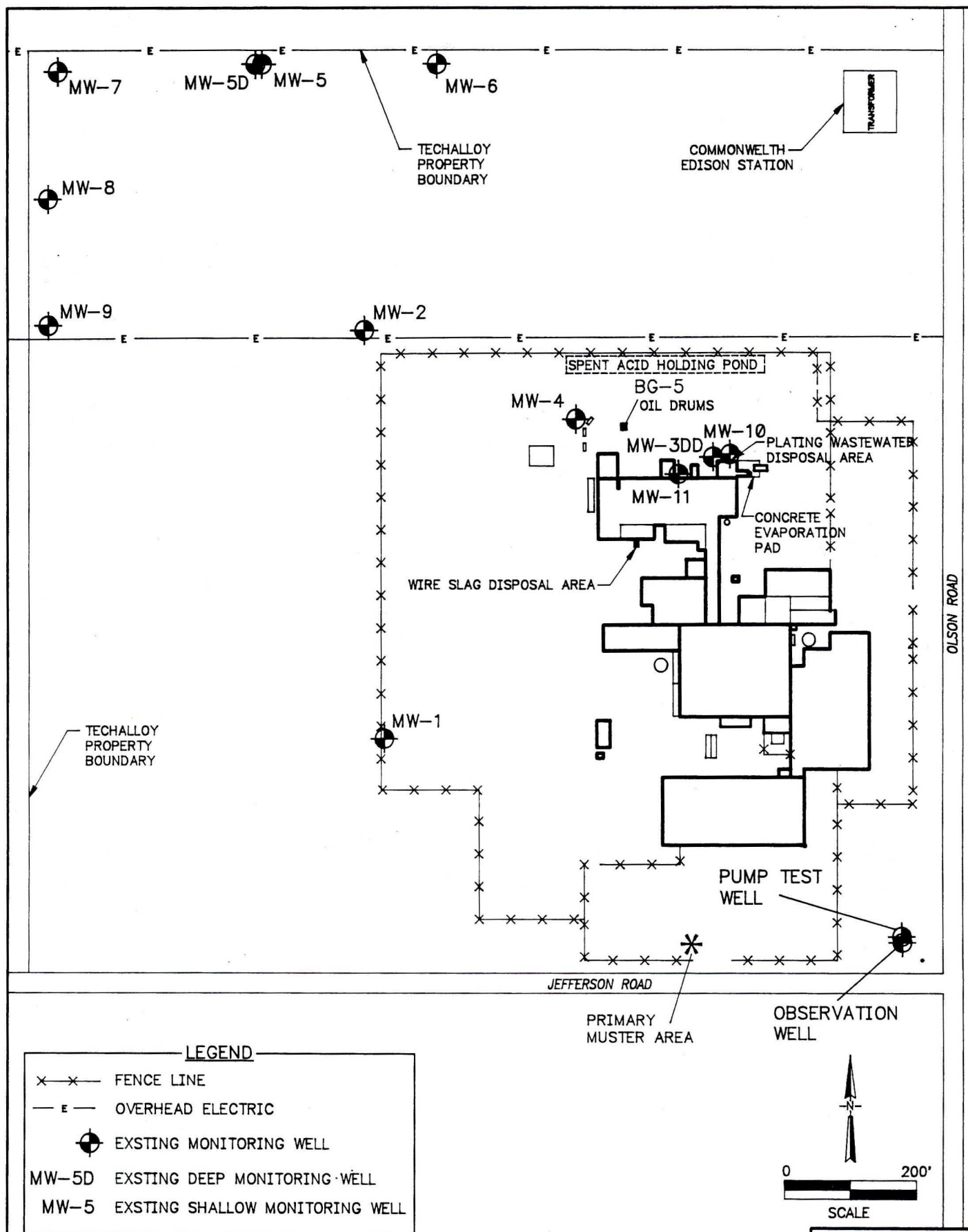
**WESTON**  
MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway  
Vernon Hills, Illinois  
60061

FIGURE  
2-1

FACILITY LOCATION MAP  
TECHALLOY COMPANY, INC.  
Union, Illinois

REV.



CAD93\200\28593

FIGURE 2-2



Three Hawthorn Parkway  
Vernon Hills, Illinois  
60061

FACILITY FEATURE MAP  
TECHALLOY COMPANY, INC.  
Union, Illinois

### Climate

McHenry County has a continental climate typical of the north central United States. This climate includes a wide range in temperature between winter and summer and an irregularly distributed, but usually abundant rainfall. Temperature extremes range from approximately -27°F to 109°F. The mean annual temperature is 49°F. The average winter temperature is 22.5°F, and the average summer temperature is 70.6°F. The annual precipitation is approximately 32 inches. Average yearly evapotranspiration for the area is 26 to 27 inches. The prevalent wind direction is from the west, although monthly variations do occur. There are no topographical barriers to air flow near the Techalloy facility.

### Demography and Land Use

The majority of the property surrounding the Techalloy facility is used for agriculture. The properties south, east, north and northwest of the facility are farmland. These areas are sparsely populated with farm-related dwellings. A few small businesses are located southwest and west of the facility along Jefferson Road, which runs along the south side of the facility. The eastern boundary of the Village of Union, Illinois, is situated approximately 125 feet west of the facility.

### Regional Geology

The surficial geology of McHenry County is composed of Wisconsinian stage glacial deposits. At least two, possibly three, glaciers advanced across the McHenry County area. The thickness of the drift left by the glaciers varies from about 50 to 400 feet, and is commonly more than 200 feet in the morainal areas that occupy the eastern four-fifths of the county (USDA, *McHenry County Soils, Soil Report 81*, 1965). The thick till deposits occur as a series of morainal ridges and till plains interspersed with areas of outwash. The

moraines and outwash plains were formed successively by retreating ice in an eastward direction. The composition of the moraines and outwash plains generally varies from clean gravel and sand, through the various loamy soils to silty clay and clay.

The first bedrock unit encountered in southwestern McHenry County is the Ordovician Age Maquoketa Formation (Willman, 1971). The Maquoketa Formation consists primarily of shale. The Maquoketa shale units are light gray to green, plastic to brittle, with some dolomite. The Maquoketa Formation is approximately 200 to 340 feet thick in this area. The Ordovician Age Glenwood St. Peter Formation underlies the Maquoketa shale. The Glenwood St. Peter Formation is a fine- to coarse-grained sandstone with minor amounts of shale. This unit is approximately 350 feet thick in this area. The Cambrian Age Ironton Galesville Formation underlies the Ordovician Formations. The Ironton Galesville is a fine- to medium-grained, well sorted sandstone, approximately 600 feet thick in this area. The Cambrian Age Mt. Simon Formation is the next and deepest unit and overlies the Precambrian crystalline rock. The Mt. Simon is a coarse-grained sandstone with lenses of shale and siltstone. The Mt. Simon is approximately 2,000 feet thick.

### Site Geology

The natural soil at and around the Techalloy facility is the Volinia silt loam. The Volinia is nearly level, well to very well drained, and approximately 3 feet thick. The Volinia is developed over loose sand and fine gravel deposits of outwash plains. The majority of the Techalloy facility's main plant area has been covered with 1 to 2 feet of gravel fill.

Boring logs from past drilling activities at the facility indicate that the surficial materials overlie poorly sorted fine-to coarse-grained sand and gravel outwash deposits. On the north side of the facility, the sand and gravel extends to 35 feet below ground surface (bgs). At the northwest property boundary, the sand and gravel unit extends to 85 feet bgs.

Underlying the sand and gravel is a silty clay till unit (Marengo Till). The till surface slopes to the northwest. The unit is approximately 80 feet thick at the facility and is underlain by the Maquoketa shale.

### **Regional Hydrogeology**

Groundwater is obtained from four major aquifer systems in northeastern Illinois glacial drift, shallow bedrock, and two divisions of the deep bedrock (Hughes *et al.*, 1966).

The glacial drift aquifer system is restricted to the unconsolidated materials overlying the bedrock; more specifically, to the sand and gravel beds. The shallow bedrock aquifer system consists of those bedrock units that commonly directly underlie the glacial drift and are recharged locally by precipitation. The major units in the system are the Silurian age dolomite and the Maquoketa shale and dolomite. The Silurian age dolomite yields the most water and is present in the eastern half of McHenry County. The Maquoketa shale and dolomite underlies the Silurian dolomite in the eastern part of the county and directly underlies the glacial drift in the western portion of the county. The Maquoketa group separates the shallow bedrock aquifer system from the underlying deep bedrock aquifer systems. The shale beds of the Maquoketa group are relatively impermeable and where present (i.e., beneath the Techalloy facility), these beds act as a confining layer above the deep bedrock aquifer systems.

The two deep bedrock aquifer systems are the Cambrian-Ordovician and the deep Cambrian. The Cambrian-Ordovician is comprised of the Glenwood St. Peter and Ironton Galesville sandstones. The deep Cambrian aquifer is the Mt. Simon sandstone, which overlies the Precambrian crystalline rock.

### Site Hydrogeology

Previous studies at the Techalloy facility have determined that groundwater occurs approximately 9 feet bgs within the sand and gravel deposits. The sand and gravel unit is the underlying aquifer.

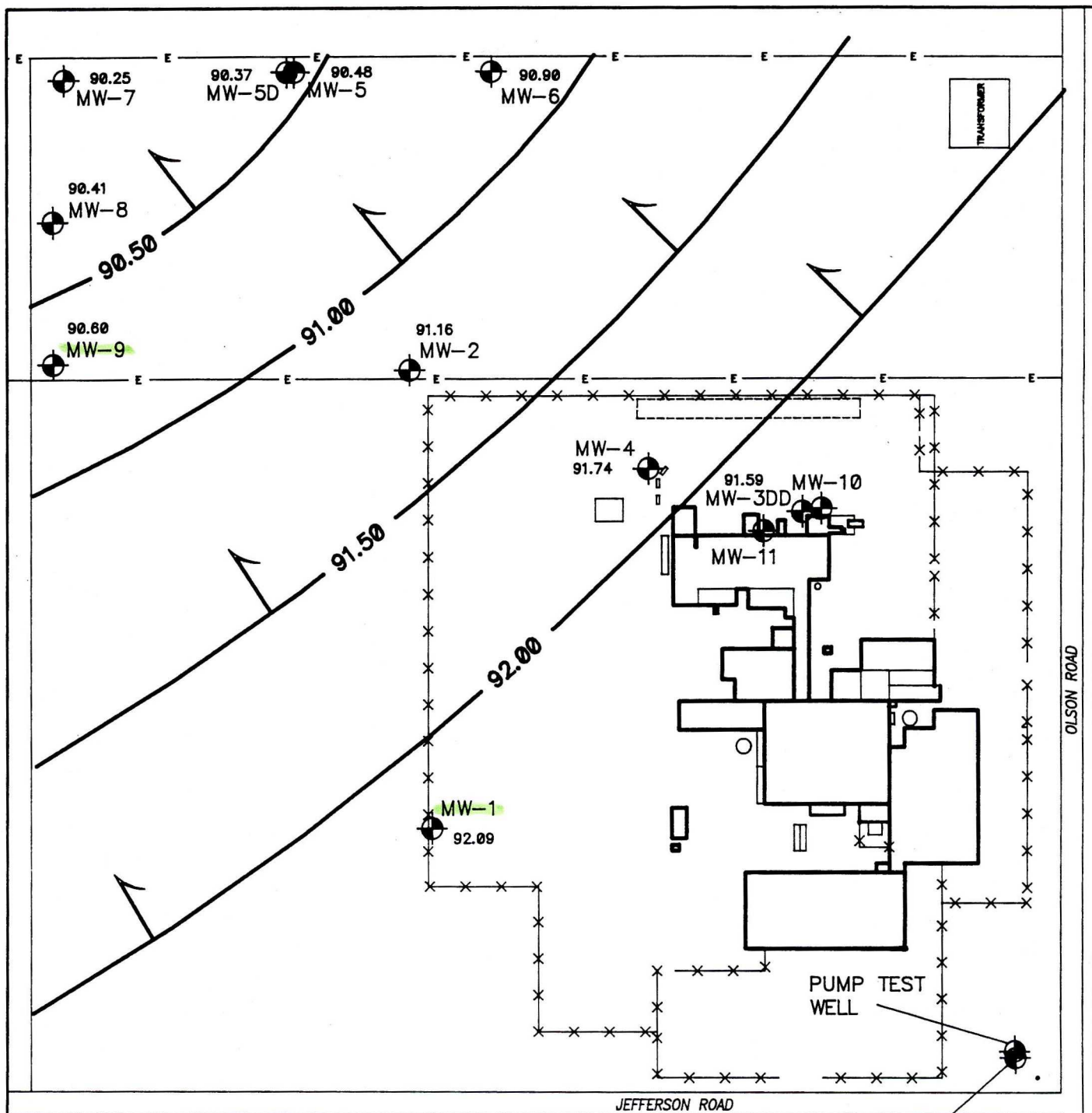
The sand and gravel unit extends from near ground surface to 35 feet bgs at the facility. At the northwest corner of the Techalloy property and beyond, the sand and gravel unit extends from near ground surface to 85 feet bgs. Immediately below the sand and gravel is the silty clay Marengo till. The upper boundary of the Marengo till constitutes the lower boundary of the sand and gravel aquifer. The Marengo till is approximately 80 feet thick in proximity to the facility and is underlain by the Maquoketa shale.

Groundwater within the sand and gravel flows northwestward (Figure 2-3). The hydraulic gradient between existing monitoring wells MW-1 and MW-9 has been measured at  $2.3 \times 10^{-3}$  ft/ft.

### History of Manufacturing Activities

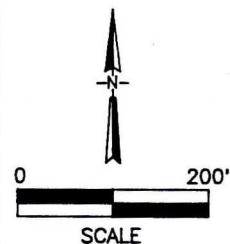
Techalloy began operations at the Union, Illinois facility in 1960. Prior to startup the property was farmland. Since 1960, Techalloy has been a specialty handler of stainless steel wire products. The end product is stainless steel wire coils of varying diameters and tensile strengths that are sent out with and without special coatings.

The basic processing of the wire at the Techalloy facility begins with cleaning of the wire, if required, to remove oils. The cleaning process uses a caustic cleaning solution with a surfactant or acids to eliminate any scale or oxides that have formed on the stainless steel wire. The second step is to add a pre-coat product to the wire which, after application,



LEGEND	
— x — x —	FENCE LINE
— E —	OVERHEAD ELECTRIC
●	EXISTING MONITORING WELL
MW-5D	EXISTING DEEP MONITORING WELL
MW-5	EXISTING SHALLOW MONITORING WELL
92.09	GROUNDWATER ELEVATION
— 91.50 —	GROUNDWATER ELEVATION CONTOUR
↗	GROUNDWATER FLOW DIRECTION

OBSERVATION WELL



CAD93\200\28593

FIGURE 2-3



Three Hawthorn Parkway  
Vernon Hills, Illinois  
60061

GROUNDWATER ELEVATION CONTOUR MAP  
TECHALLOY COMPANY, INC.  
Union, Illinois

provides a rough surface so that soap lubricant will be pulled onto the wire as it is being drawn through the dyes on the drawing machines. The pre-coat product also serves to protect the wire so that it does not get scratched when it is pulled through the dyes.

After this process, the wire is sent back to the caustic bath to remove soaps and pre-coat prior to annealing. After annealing, the scale on the wire is removed by dipping the wire in ammonium bifluoride or potassium permanganate, followed by nitric acid, sodium hydroxide, and sulfuric acid. Another coating of pre-coat is then applied prior to being drawn in the high rate drawing machine. The wire is cleaned in an ultrasonic bath and then annealed further. The pre-coat is then removed in the caustic bath and the wire is sent to the straightening and cutting department or to the shipping department.

A coating process is used for some wires to provide an additional lubricant for other processing. Typically, this coating consists of a nickel chloride strike followed by a potassium copper cyanide or a copper cyanide dip to provide a very thin coating of copper, which serves as a lubricant for further processing.

Past manufacturing processes included the use of virgo salts for descaling instead of potassium permanganate. In this process, the wire was drawn through a molten bath of virgo salts to descale the wire. This process has been replaced by the ammonium bifluoride/potassium permanganate processes used currently.

Prior to 1978, chlorinated solvents were used to clean wires. In 1978, the use of chlorinated solvents stopped, and the wires were cleaned in an ultrasonic water bath.

Another past process that was used at the Techalloy facility that has since been discontinued was the use of lead coating to provide lubrication prior to drawing through dyes. In the early existence of the Techalloy facility, lead coating was the only coating process known to